Costs and Returns for Crop Production in Alberta

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SUMMARY OF 1984 PRODUCTION COSTS AND RETURNS

FOR CROP PRODUCTION IN ALBERTA

USING THE CASE STUDY APPROACH

BY

LLOYD J. ANDRUCHOW

PRODUCTION & RESOURCE ECONOMICS BRANCH
ECONOMIC SERVICES DIVISION
ALBERTA DEPARTMENT OF AGRICULTURE
1985

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LLOYD ANDRUCHOW
AGRICULTURAL ECONOMIST

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	i
LIST OF TABLES	iv

SECTION

I COSTS OF PRODUCING GRAIN AND OILSEEDS IN ALBERTA - 1984

Introduction	1
Objectives	2
Study Sample and Survey Method	2
Method of Analysis	3
Value of Production	4
Variable Costs	4
Capital Costs	8

II SUMMARY OF REGIONAL COSTS AND RETURNS FOR THE TOTAL GRAIN FARM

	10
Value of Production	10
Variable Costs	10
Capital Costs	13
Total Production Cost	14
Evaluating the Performance of Grain Farms	16

III SUMMARY OF COSTS AND RETURNS FOR DRYLAND CROPS SURVEYED

	19
Wheat Production	20
Barley Production	22
Canola Production	24
Oats Production	26
Summerfallow Costs	28

IV SUMMARY OF COSTS AND RETURNS FOR IRRIGATED CROPS 30

V A COST COMPARISON OF SUMMERFALLOW CROPPING VERSUS STUBBLE CROPPING 37

Wheat Production on Summerfallow Versus Stubble In the Calgary (Oyen-Hanna) Region 38

Wheat Production on Summerfallow Versus Stubble In the Red Deer (Stettler-Coronation) Region 40

Canola Production on Summerfallow Versus Stubble In the Red Deer (Stettler-Coronation) Region 40

VI A COMPARISON OF CROP ALTERNATIVES BY REGION 44

Peace River Region 44

Barrhead Region 46

Vermilion Region 48

Red Deer (Stettler-Coronation) Region 48

Calgary (Oyen-Hanna) Region 51

Lethbridge (Dryland) Region 53

VII A COST COMPARISON OF CROP PRODUCTION BY LAND TENURE 56

LIST OF TABLES

TABLE NUMBER		PAGE
1A	LIST OF GRAIN/OILSEED PRICES USED IN VALUING 1984 CROP DRYLAND	5
1B	LIST OF GRAIN/OILSEED PRICES USDED IN VALUING 1984 CROP IRRIGATION	6
2	REGIONAL COMPARISON OF COSTS AND RETURNS ON CROP FARMS - 1984	11
2A	BREAKDOWN OF VARIABLE COSTS ON CROP FARMS BY REGION - 1984	12
2B	SUMMARY OF INVESTMENT BY REGION - 1984	15
3	DRYLAND CROPPING PATTERN BY REGION - 1984	19
4	REGIONAL COMPARISON OF COSTS AND RETURNS FOR WHEAT PRODUCTION - 1984	21
5	REGIONAL COMPARISON OF COSTS AND RETURNS FOR BARLEY PRODUCTION - 1984	23
6	REGIONAL COMPARISON OF COSTS AND RETURNS FOR CANOLA PRODUCTION - 1984	25
7	REGIONAL COMPARISON OF COSTS AND RETURNS FOR OATS PRODUCTION - 1984	27
8	REGIONAL COMPARISON OF COSTS AND RETURNS FOR SUMMERFALLOW - 1984	29
9	1984 IRRIGATED CROP ACRES	30
10	SUMMARY OF COSTS & RETURNS FOR IRRIGATED CROPS - 1984	32
11	SUMMARY OF 1984 COSTS AND RETURNS FOR IRRIGATED CROPS - LETHBRIDGE REGION	34
12	SUMMARY OF COSTS & RETURNS FOR IRRIGATED CROPS - 1984	35
13	SUMMARY OF COSTS & RETURNS FOR IRRIGATED CROPS - 1984	36
14	COSTS AND RETURNS COMPARISON FOR WHEAT PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - CALGARY (OYEN-HANNA) REGION	39

15 COSTS AND RETURNS COMPARISON FOR WHEAT PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - RED DEER (STETTLER-CORONATION) REGION 41

16 COSTS AND RETURNS COMPARISON FOR CANOLA PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - RED DEER (STETTLER-CORONATION) REGION 42

17 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE PEACE RIVER REGION - 1984 45

18 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE BARRHEAD REGION - 1984 47

19 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE VERMILION REGION - 1984 49

20 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE RED DEER (STETTLER-CORONATION) REGION - 1984 50

21 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE CALGARY (OYEN-HANNA) REGION - 1984 . . . 52

22 REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE LETHBRIDGE (DRYLAND) REGION - 1984 . . . 54

23 DEBT SERVICING REQUIREMENTS FOR A TYPICAL LAND PURCHASE. 56

24 SUMMARY OF LAND TENURE BY REGION 57

25 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 PEACE RIVER REGION 61

26 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 BARRHEAD REGION 62

27 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 VERMILION REGION 63

28 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 RED DEER (STETTLER-CORONATION) REGION 64

29 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 CALGARY (OYEN-HANNA) REGION 65

30 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 LETHBRIDGE (DRYLAND) REGION 66,67

31 SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 LETHBRIDGE (IRRIGATION) REGION 68

SECTION I

COSTS OF PRODUCING GRAIN AND OILSEEDS IN ALBERTA - 1984

Introduction

The Production and Resource Economics Branch of Alberta Agriculture initiated the case study approach in the fall of 1983 to monitor production costs and returns for the major crops grown in Alberta. As a resource group to Alberta Agriculture staff, primary and prospective producers, and agribusiness, the branch recognizes the need for a current and comprehensive data base on farm capital investments, material inputs, cultural practices, yields, and costs and returns for all farm enterprises. This project is a major research initiative to establish a representative production cost and return data base for major crop enterprises in each of the regions in Alberta.

A total of sixty-nine (69) grain farms situated in four of the agricultural regions in Alberta - Red Deer, Vermilion, Barrhead, and Peace River - were able to provide financial and physical data relative to the 1983 study year. A report summarizing the 1983 study results was published in January, 1985.

Following an appraisal of the 1983 study year and the general interest and enthusiasm among the participants, it was decided that the project be continued and expanded into all agricultural regions, i.e. Calgary and Lethbridge. Also a second questionnaire and computer program was developed to facilitate the analysis of irrigated crop farms in the Lethbridge region.

This report summarizes 1984 costs and returns data for dryland crops in all six agricultural regions in Alberta as well as for irrigated crops in the Lethbridge region. The study results are based on a total of 133 farms, of which 108 were dryland and the remaining 25 were irrigated.

Objectives

The primary objective of this report is to provide extension personnel and the general public with factual cost of production information for grain and oilseed crops. Other objectives are as follows:

1. To obtain and document current and actual production costs for the main grain and oilseed crops grown in Alberta;
2. To document detailed input/output and costs/returns data by crop enterprise for the six farming regions in Alberta and the total province;
3. To provide each study participant with accurate and detailed costs/returns information on an enterprise and whole farm basis;
4. To provide each study participant with a comparative interpretation of his crop enterprises relative to the total group studied in his region;
5. To regularly monitor and periodically update the above data base;
6. To establish and maintain contact with the farming community and to be able to respond promptly to the needs of producers;
7. To provide headquarter staff, agri-businesses, and the extension field staff with current, accurate, and comprehensive information.

Study Sample and Survey Method

Participants for the 1984 study year were selected by the various District Agriculturists on the basis of several criteria developed by the Regional Economist and the regional farm management planning committees. Factors considered in the selection of farms included farm size, crop rotation, availability of accurate records, level of input use, soil type, etc. Before committing the farms for study, the selected farmers were contacted by the District Agriculturist who briefed them as to the study objectives and the information they would be asked to provide.

The questionnaire which was used to gather the information contained two sections. Section I was a record of all investment items and cash expenditures associated with the farm and was similar to the information required for income tax purposes. Section II was designed to record data specific to each crop enterprise, that is, acres, yield, input costs, returns, etc.

Study participants were contacted after harvest in order to arrange a personal visit for the purpose of completing the two page questionnaire. After analyzing the raw data, the preliminary results and group averages were personally delivered to the participants in order to be reviewed and revised if necessary. Many District Agriculturists participated in the study by accompanying the enumerator during the data collection and data dissemination stages. By March 1985, all of the final individual results and group averages were returned to the participants so that they could be used in the preparation of budgets and plans for the 1985 crop year. Summary results were also mailed to the various extension personnel in order to update their data base.

Method of Analysis

All costs and returns data presented in this report are group averages expressed on a per acre and per bushel basis. The costs shown in the summary pages were calculated for each category of expense by dividing the total of all expenses by the total number of units of production. For example, the fertilizer expense for wheat grown on five farms is calculated by adding the total fertilizer expense for each farm, and then dividing by the total wheat acreage for the five farms. Thus, the costs and returns are weighted on a per unit of production basis rather than calculated using the simple average approach. In some cases, certain cost items were not incurred in an individual operation and as such were taken into account in the method used in determining the average cost.

As observed, costs varied significantly from farm to farm and across the regions and districts. This variability among farms is attributable to such factors as climate, soil type and the management skills of the operators.

Consistent with the principles of economics, the larger scale operators exhibited more efficient operations in comparision to their smaller counterparts. This is largely due to some of the larger scale operators being able to achieve cost efficiencies by purchasing inputs in larger quantities at discount rates and using resources such as machinery and labour more efficiently. On the return side, some operators were able to secure more advantageous marketing arrangements.

The following paragraphs contain definitions of some of the terms and concepts as used within this report.

Value of Production

Crop Sales: The value of the crop grown during the study year had to be estimated since normally the total harvest is not completely sold until sometime during the next calendar year. However, if the crop had been completely sold at the time of data collection the actual price received was used to determine the total income from that enterprise. Shown in Table 1 are the price estimates that were used for the 1984 crop.

Insurance Receipts: The 1984 crop was considered to reflect lower to average production in terms of yield per acre. This was observed for many of the northern areas which received excessive amounts of rainfall early in the growing season while others suffered losses due to drought (especially in southern Alberta), hail and frost. As such, the significance of crop insurance payouts increased in 1984 as the Alberta Hail and Crop Insurance Corporation paid out to farmers a record amount in lieu of shortfalls in grain and oilseed production.

Variable Costs

Labour Cost: Most study participants relied on hired labour to perform some of the necessary farming operations. The category entitled unpaid family labour in the variable cost section of the summary report includes the cost of the operator, the operator's wife and child labour. The labour rates used to calculate this cost in 1984 were $6.50 per hour for the operator and $4.00 per hour for the other family members.

TABLE 1A: LIST OF GRAIN/OILSEED PRICES USED IN VALUING 1984 CROP - DRYLAND

CROP	GRADE	Price	
		$/Bu	$/tonne
Canola	1 Can	8.00	352.74
	2 Can	7.70	339.51
	3 Can	5.91	260.74
Wheat	1 CR	4.70	172.70
	2 CR	4.49	164.98
	3 CR	4.40	161.58
	Feed	3.95	145.00
Barley	1 FD	2.60	119.42
	2 FD	2.53	116.20
	3 FD	2.38	109.31
Oats	1 FD	1.62	105.04
	2 FD	1.57	101.80
Mixed Grain		2.00	110.77
Rye		2.79	110.00
Flax		8.13	320.00
Durum Wheat		4.92	180.70
Winter Wheat		4.37	160.57

TABLE 1B: LIST OF GRAIN/OILSEED PRICES USED IN VALUING 1984 CROP-IRRIGATION

CROP	Price	
	$/Bu	$/tonne
Sugar Beets		35.00
Soft Wheat	4.24	155.79
Barley	2.60-3.30	119.41-151.57
Barley Silage		26.00-28.00/ton
Alfalfa Hay		80.00-105.00/ton
Sunflowers	.15/lb	
Dry Peas	.13/lb	
Processing Peas		121.00-385.00/ton
Grain Corn	4.25	167.31
Corn Silage		32.00-43.00/ton
Sweet Corn		150.00-298.00/ton
Dry Beans	.22-.27/lb	

Material Costs: Most supplies used in grain production were bought during the current production year and recorded as such in the year-end statement. However, it was necessary to record the inventory of many inputs such as seed, fertilizers and chemicals as these inputs might have been purchased the previous year for use in the production year under study. An attempt was made to accurately monitor all costs of inputs used during the twelve month production period, regardless of when purchased or applied to the land. Home-grown seed was valued at market prices and entered as such in the variable cost section of the enterprise analysis.

Crop/Hail Insurance: It now appears that more grain farmers are exercising the option of acquiring crop insurance. The incidence of crop/hail insurance policies on grain farms was greater in some regions than others, depending upon the frequency of adverse weather conditions that seriously affect crop production. Crop/Hail insurance premiums were recorded for the total farm and then allocated to the different crops according to coverage.

Machine Operating Costs: Machine operating costs consisted of fuel, oil, lube and repairs. Each study participant provided his total fuel and repair costs for the calendar year under study which was then allocated to each of the crop enterprises studied. On the average, the fuel and repair costs associated with an acre of summer-fallow were approximately 45 per cent of that used on a cropped acre.

Miscellaneous Costs: Miscellaneous costs included subscriptions to farm magazines, office supplies, accounting and legal fees, etc. as well as building repairs, utilities, custom work and operating interest paid. Interest paid on operating capital was the actual amount paid by the participant during the year of study and was allocated to only the cropped acres. Utilities include heating fuel, telephone and power, and were allocated on an average basis accordingly to the various grain/-oilseed enterprises.

Capital Costs

Cash Rent/Crop Share: Costs associated with the primary or fixed resources used in grain production are indicated in the capital cost section. Land represented the major part of the investment and it's actual cost related to tenure and equity. Rented land used in crop production was most commonly expressed on a cash rent basis and reflected the actual market value at the time of analysis. For rented land using a crop share arrangement, yield, price per bushel, as well as the cost of inputs were used to arrive at the net land cost.

Taxes and Insurance: Actual costs were recorded for land taxes and building/equipment insurance. These costs are associated with the ownership of capital assets therefore being considered as capital overhead costs.

Paid Capital Interest: The actual cost associated with owned land depended on the equity levels reported by the various farms. Beginning farmers who recently purchased their farms had high ownership costs in terms of mortgage interest as compared to established farmers. Interest on land as well as the interest paid on buildings and machin-

ery loans were included under the heading of "Paid Capital Interest". Return to equity was also calculated since the participants had provided the market value of all of their investment as well as the amount of liabilities for each category of investment.

Depreciation: Depreciation was determined for all of the buildings and machinery that were used in grain production. In some cases, depreciation was calculated by taking a percentage of the market value that was appropriate to the grain enterprise and dividing by the estimated remaining years of useful life. Building depreciation was allocated only to the crop enterprise (on a per acre basis) while machinery depreciation was allocated to all enterprises including summerfallow. As calculated, the machinery depreciation cost associated with an acre of summerfallow was approximately 45 per cent of a cropped acre.

SECTION II

SUMMARY OF REGIONAL COSTS AND RETURNS FOR THE TOTAL GRAIN FARM

This section provides detailed information on the average regional costs and returns for the grain farms studied in 1984. The number of farms participating in this study ranged from seven(7) in the Red Deer - Calgary regions to 37 in the Vermilion region. Average acreage per farm under cultivation ranged from 704.40 in the Lethbridge Irrigated region to 1,786.00 in the Calgary (Oyen-Hanna) region. Table 2 provides a cost and return summary of the average grain farm studied in each region.

Value of Production

The value of production expressed on a per acre basis was derived from two sources, namely, from the value of the crop itself and secondly, from crop and hail insurance received. With 1984 representing a year of lower to average yields, crop insurance income on some farms was significantly higher in comparison to income received from crop sales. Weighted average values of production on a per cultivated acre basis ranged from $59.78 in the Calgary (Oyen-Hanna) region to $328.00 per acre in the Lethbridge - Irrigated region. As to the importance of crop insurance, 28.9 per cent of the value of production in the Lethbridge - Dryland region or $17.40 per acre was accounted for by crop insurance income.

Variable Costs

The variable cost includes all money costs that must be incurred if an enterprise is to function. Variable costs generally represent approximately 60 per cent of the total production costs. Of major importance are the costs for material inputs, labour and machine operation. Table 2A presents a detailed breakdown of the cost items comprising the total variable cost.

TABLE 2: REGIONAL COMPARISON OF COSTS AND RETURNS ON CROP FARMS - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)	LETHBRIDGE (IRRIGATION)
Number of Farms	12	23	37	7	7	24	25
Average Farm Size (Acres)	896.20	1292.77	1166.57	1602.57	1786.00	1438.42	704.40
				Dollars Per Acre			
Crop Sales	112.90	173.68	136.01	104.76	55.21	42.84	323.13
Insurance Receipts	-	7.79	3.28	9.65	4.57	17.40	4.87
VALUE OF PRODUCTION	112.90	181.47	139.29	114.41	59.78	60.25	328.00
VARIABLE COST							
Materials	24.75	37.54	31.11	35.01	16.72	15.58	71.11
Hail/Crop Insurance	2.36	3.74	2.80	2.96	1.80	3.34	9.24
Fuel and Repairs	16.28	14.47	13.85	10.00	8.62	8.87	44.13
Paid Labour	3.04	1.73	3.37	4.91	1.44	4.13	0.51
Operator Labour	10.22	11.45	13.98	9.85	6.64	8.92	27.15
Miscellaneous	8.84	5.14	6.37	11.09	3.99	7.55	56.43
TOTAL VARIABLE COST	65.49	74.07	71.48	73.82	39.21	48.39	208.57
CAPITAL COST							
Cash Rent/Crop Share	4.03	16.84	10.24	13.16	6.21	4.97	18.39
Taxes and Insurance	3.34	2.99	2.96	2.42	1.39	2.76	13.80
Equip.,Bldg. Depreciation	21.68	24.64	22.76	18.78	13.89	12.10	55.90
Paid Capital Interest	10.40	5.61	10.25	10.64	5.77	5.05	53.24
TOTAL CAPITAL COST	39.44	50.08	46.20	44.99	27.26	24.88	141.33
TOTAL COST	104.93	124.15	117.69	118.81	66.47	73.27	349.90
Return to Capital(Cont. Margin)	47.41	107.40	67.80	40.59	20.57	11.86	119.43
Return to Equity	7.97	57.32	21.60	-4.40	-6.69	-13.02	-21.90
Return to Equity (%)	1.84%	9.35%	4.17%	-1.05%	-2.26%	-2.77%	-2.23%
Equity	82%	91%	84%	80%	82%	90%	68%
Debt Capacity ($/Ac)	300.18	711.15	441.68	260.01	130.68	61.93	719.44
Productive Value of Land ($/Ac)	147.97	701.61	340.09	117.98	19.16	-44.00	298.96
Market Value of Land ($/Ac)	369.74	837.72	527.49	503.02	328.00	603.21	1128.86
Machinery Investment ($/Ac)	192.74	216.35	202.76	159.02	122.12	103.48	511.30

TABLE 2A: BREAKDOWN OF VARIABLE COSTS ON CROP FARMS BY REGION - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)	LETHBRIDGE (IRRIGATION)
	- - - - - - - - - - - - - - - - - - Dollars Per Acre -						
Crop Sales	112.90	173.68	136.01	104.76	55.21	42.84	323.13
Insurance Receipts	0	7.79	3.28	9.65	4.57	17.40	4.87
VALUE OF PRODUCTION	112.90	181.47	139.29	114.41	59.78	60.25	328.00
VARIABLE COSTS							
Seed	5.10	5.59	5.41	5.30	3.83	3.90	14.63
Fertilizer	13.90	19.89	16.72	16.80	7.59	6.98	39.40
Chemicals	5.75	12.06	8.98	12.91	5.30	4.70	17.08
Hail/Crop Insurance	2.36	3.74	2.80	2.96	1.80	3.34	9.24
Fuel	9.66	8.91	8.24	6.12	5.22	4.99	23.60
Repairs - Machine	6.62	5.56	5.61	3.88	3.40	3.88	20.53
Repairs - Buildings	1.55	0.25	0.96	1.15	0.34	0.54	1.73
Utilities	2.41	1.29	1.75	0.96	0.58	1.15	13.22
Custom Work	0.70	0.92	0.70	1.97	0.98	3.62	31.34
Miscellaneous	2.66	1.48	1.76	1.08	0.77	1.74	4.79
Operating Interest Paid	1.52	1.20	1.21	5.93	1.33	1.10	5.34
Paid Labour	3.04	1.73	3.37	4.91	1.44	4.13	0.51
Family and Operator Labour	10.22	11.45	13.98	9.85	6.64	8.92	27.15
TOTAL VARIABLE COST	65.49	74.07	71.48	73.82	39.21	48.39	208.57
Return to Capital or Contribution Margin	47.41	107.40	67.80	40.59	20.57	11.86	119.43

Seed, fertilizer, and chemical costs on dryland ranged from a low of $15.58 per acre in the Lethbridge region to $37.54 per acre in the Barrhead region on a total farm basis. This compares to a material cost of $71.11 per acre for the Lethbridge Irrigation region. The total variable costs on dryland ranged from $39.21 in the Calgary (Oyen-Hanna) region to $74.07 per acre in the Barrhead region. A variable cost of $208.57 per acre was observed for the Lethbridge irrigation district.

Value of production less the total variable cost equals return to capital or contribution margin. The return to capital is the residual to cover the capital cost associated with land, machinery and building investment. Contribution margins are often used by producers to compare the profitability of various crops. As Table 2A shows, return to capital on dryland farms ranged from $11.86 per acre in the Lethbridge region to $107.40 per acre in the Barrhead region. Returns to capital on irrigation farms in the Lethbridge region averaged $119.43 per acre.

Capital Costs

Costs associated with the primary or fixed resources used in grain production are indicated in the capital cost section of Table 2. The actual cost of land will depend on the tenure and equity position established by the operator. For example, some operations on the study indicated a 100 per cent equity and no rented land, thereby resulting in no actual cost incurred for land. On the other extreme were those operations with high interest payments associated with land that was purchased on terms. The cash rent/crop share values reported reflect market prices and are spread out over all acres farmed. These values ranged from $4.03 per acre in the Peace River region to $18.39 per acre in the Lethbridge irrigation district. Taxes and insurance on dryland farms which are associated with the ownership of fixed resources are reported separately, ranging from $1.39 per acre in the Calgary (Oyen-Hanna) region to $3.34 per acre in the Peace River region. Water and land taxes in the Lethbridge irrigation district averaged $13.80 per acre. Building and equipment depreciation on dryland farms based on market value ranged from $12.10 per acre in the Lethbridge region to $24.64 per acre in the Barrhead region. The lower deprec-

iation cost in the Lethbridge Region is as a result of their lower investment in machinery/buildings which in 1984 was $138.42 per acre compared to that of $276.49 per acre in the Barrhead region. The average market values for land by region as reported by study participants along with the investment in machinery and buildings are shown in Table 2B.

Interest payments associated with the ownership of the capital resources namely land, machinery and buildings are shown as a separate entry entitled paid capital interest. As a matter of interest, the weighted average interest rate for capital loans ranged from 8.69 per cent in the Calgary (Oyen-Hanna) region to 11.59 per cent in the Lethbridge irrigation district. The total interest paid on capital loans on dryland farms ranged from $5.05 per acre in the Lethbridge region to $10.64 per acre in the Red Deer region. The paid capital interest for the Lethbridge irrigation group was $53.24 per acre which is directly related to the high investment and also the relatively lower equity of 68 per cent. To summarize, total capital costs which include cash rent/-crop share, taxes and insurance, equipment and building depreciation, and paid capital interest on dryland farms ranged from $24.88 per acre for the Lethbridge region to $50.08 per acre for the Barrhead region. Capital costs on irrigation farms averaged $141.33 per acre.

Total Production Cost

Total production cost was obtained by summing the total variable cost and the total capital cost. From Table 2, total production costs on dryland farms ranged from $66.47 per acre in the Calgary (Oyen-Hanna) districts to $124.15 in the Barrhead region. Total production cost on irrigation farms averaged $349.90 per acre.

The large variation in per acre production cost on a total farm basis is attributable to factors such as cropping percentage, investment levels, equity position, level of input use, and land tenure. To elaborate, the farms in the Calgary region (Oyen-Hanna) cropped 65 per cent of the cultivated acreage in comparison to the 89 per cent cropped in the Barrhead region. This lower cropping percentage will result in lower material costs, labour costs, machine operation costs and machine/building investment. Material, fuel and repairs, and labour costs averaged $33.42 per acre on the Oyen-Hanna farms in comparison

TABLE 2B: SUMMARY OF INVESTMENT BY REGION - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)	LETHBRIDGE (IRRIGATION)
				Dollars Per Acre			
Buildings	48.12	60.14	49.60	57.62	33.66	34.94	95.32
Machinery	192.74	216.35	202.76	159.02	122.12	103.48	511.30
Land (Market Value)	369.74	837.72	527.49	503.02	328.00	603.21	1128.86
TOTAL	610.60	1114.21	779.85	719.66	483.78	741.63	1735.48

to $65.19 in the Barrhead region, a difference of 95 per cent. As to land tenure, the average farm in the Barrhead region owned 47 per cent of the land farmed in comparison to 63 per cent in the Calgary (Oyen-Hanna) region. This along with the higher land values and productivity in the Barrhead region accounts for the high cash rent/crop share in Barrhead of $16.84 per acre as compared to $6.21 in the Calgary (Oyen-Hanna) region. The total investment (land, buildings, machinery) for the Calgary (Oyen-Hanna) farms averaged $483.78 per acre in comparison to $1,735.48 per acre for the Lethbridge irrigation farms.

Evaluating the Performance of Grain Farms

The performance of any grain farm must be constantly monitored if the best returns are to be achieved from the resources employed. To do this, a number of parameters have been established which, if adhered to, results in a successful enterprise.

Perhaps one of the best indicators used in evaluating performance is that of the return to capital otherwise known as the contribution margin. Simply defined, the contribution margin is that amount which is left over after the total variable cost has been deducted from the value of production. Should this value ever become negative this implies that the enterprise is failing. That is, the value of production generated is insufficient to cover the total variable cost, thus resulting in a loss. From Table 2A, it is quite evident that all of the regions were covering their total variable cost. Of all the regions studied, the highest contribution margir on a per acre basis was attained by the Lethbridge irrigation district which was calculated to be $119.43. As to the dryland areas, the return to capital ranged from $11.86 per acre in the Lethbridge dryland area to $107.40 per acre in the Barrhead region.

Another indicator used to measure performance is that of the return to equity or profit. Return to equity may be defined as that residual which is left over for future investment after all production costs have been deducted. That is, both the variable costs and capital costs are deducted from the value of production. For the study, capital cost included items such as cash rent/-crop share, taxes and insurance, equipment and building costs, depreciation and paid capital interest. Referring back to Table 2, shows that only the

three most northerly regions experienced a positive return to equity in 1984, with the most profitable grain farms being located in the Barrhead region. The return to equity for the farms in the Barrhead region was $57.32 per acre or 9.35 per cent. The Vermilion region indicated the second highest return to equity at $21.60 per acre or 4.17 per cent. The farms in the Red Deer, Calgary (Oyen-Hanna) Lethbridge dryland, and Lethbridge irrigation areas were short of covering all production costs by $4.40, $6.69, $13.02, and $21.90 per acre, respectively.

Also shown in Table 2 is the debt capacity. Debt capacity is the amount of debt the farm can support based on the performance of the farm in 1984. It is calculated by summing the return to equity, the paid capital interest and depreciation, the total of which is amortized over a period of 15 years at 12 per cent. It should be noted that in the calculation of debt capacity no consideration was given to income tax. Debt capacity ranged from $61.93 per acre in the Lethbridge dryland region to over $700.00 per acre in the Barrhead and Lethbridge irrigation regions, implying that farms in the latter regions were in a much better financial position to service a larger debt load when compared to the remaining five areas studied.

Given as well in Table 2 is the productive value of land. The productive value of land is different from its market value in that it is a derived value based upon the performance of agricultural land with respect to net returns from grain production. Essentially, it is calculated by summing the return to equity, paid capital interest (land loan portion only) and cash rent/crop share, the total of which is amortized over a 25 year period at 10 per cent. Productive land values tend to approach or exceed its market value in years when yields are exceptionally high. However, in 1984 when yields were generally below average the productive land values were well below the reported market values. For example, the Lethbridge irrigation region reported the highest market value for land at $1,128.86 per acre while its actual productivity value was $298.96 per acre. On the other hand, this difference was quite small for the Barrhead region which reported an average market value of $837.72 per acre and a land productive value of $701.61 per acre. For the Vermilion region, the productive value of land was $340.09 per acre while the market value was $527.49 per acre. Due to the severe drought in the Lethbridge dryland areas in 1984, there was no return to land.

Average machinery investment among the dryland regions varied by over $100 per acre ranging from $103.48 in the Lethbridge dryland region to $216.35 per acre for the Barrhead region (see Table 2B). Generally speaking, the average machinery investment on dryland farms decreases as one moves southward across the province. The average machinery investment on irrigation farms in the Lethbridge region was $511.30 per acre.

SECTION III

SUMMARY OF COSTS AND RETURNS FOR DRYLAND CROPS SURVEYED

This section provides detailed information on the average regional costs and returns for the dryland crops analyzed in 1984. Costs and returns data presented in this section are based on the information collected from 108 dryland farms. As a cautionary note, some regions are more represented than others and therefore it is difficult to compare yield and cost data among the regions. Wheat was the most extensively grown crop on the average farm studied occupying 39 per cent of the cultivated area. The table below shows the average acreage per participating farm as well as the main crops and summerfallow acres in each region. Wheat production in the three southerly regions accounted for 41.7, 53.9, and 48.0 per cent of the total cultivated acres in the Red Deer (Stettler-Coronation), Calgary (Oyen-Hanna) and Lethbridge regions, respectively, compared to less than 37 per cent in the other three regions.

TABLE 3: DRYLAND CROPPING PATTERN BY REGION - 1984

	WHEAT	BARLEY	CANOLA	OATS	SUMMERFALLOW	TOTAL
	Acres Per Farm					
Peace River	314.19	175.50	202.10	-	162.40	854.19
Barrhead	168.02	646.26	278.57	54.45	122.08	1269.38
Vermilion	415.32	218.29	336.07	26.22	173.52	1169.42
Red Deer (Stettler - Coronation)	630.86	153.57	483.36	40.71	204.36	1512.86
Calgary (Oyen-Hanna)	890.71	55.00	40.00	109.00	558.19	1652.90
Lethbridge Dryland	639.22	162.27	54.38	29.63	446.38	1331.88
AVERAGE	509.72	235.15	232.41	43.34	277.82	1298.44

With respect to the four main crops - wheat, barley, oats, canola - barley production in 1984 in Alberta was second to wheat in terms of acres seeded and accounted for 30.8 per cent of the area seeded to these crops. The average dryland farm on study in 1984 grew 235.15 acres of barley representing 18.1

per cent of the total cultivated area. Barley production was the main crop grown in the Barrhead region where the average farm on study grew 646.26 acres or 50.9 per cent of cultivated area.

Canola production in Alberta ranked third in 1984 and represented 17.4 per cent of the area seeded of the four main crops mentioned. On a regional basis, canola production was second in terms of acres seeded in the Peace River, Vermilion, and Red Deer (Stettler-Coronation) region representing 23.7, 28.7, and 32.0 per cent of the cultivated area, respectively.

The summerfallow acreage as a proportion of the total cultivated acreage ranged from a low of 9.6 per cent in the Barrhead region to a high of 33.5 per cent in Calgary (Oyen-Hanna) and Lethbridge dryland regions.

Wheat Production

The extreme variation in growing conditions within the Province in 1984 accounts for the wide range in yields obtained. Average wheat yields in 1984 ranged from a low of 9.93 bushels in the Lethbridge dryland region to 50.12 bushels in the Barrhead region. The crop sales value per acre ranged from $45.50 in the Lethbridge dryland area to $207.50 in the Barrhead region. Crop Insurance receipts were significant in the Lethbridge dryland region averaging $26.59 per acre and accounting for 36.9 per cent of the value of production. Table 4 presents costs and returns data for wheat production by region.

There was some variation in variable costs among the six study areas. Of all cost items appearing in the variable cost section, material input costs had the largest variation ranging from $20.97 in the Lethbridge dryland region to $43.70 in the Barrhead region. Fuel and repair costs associated with machine operation were highest in the Peace River region at $18.87 per acre and decreased continuously when moving south across the province. Although the Barrhead region had the highest total variable cost at $81.74 per acre, their above average yields resulted in the lowest per bushel cost at $1.63. The Calgary (Oyen-Hanna) region had the lowest per acre variable cost at $53.61 or $2.77 per bushel produced.

Capital cost for wheat production ranged from $32.14 per acre in the Lethbridge dryland region to $58.34 in the Barrhead region. The item contributing to this difference was the value of cash rent/crop share at $26.55 per

TABLE 4: REGIONAL COMPARISON OF COSTS AND RETURNS FOR WHEAT PRODUCTION - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)
Number of Enterprise	16	19	56	11	17	35
Average Acreage	196.37	203.39	274.41	361.00	366.76	281.29
Average Yield (Bu/Acre)	33.76	50.12	34.01	23.85	19.32	9.93
	- Dollars Per Acre - - - - - - - - - - - -
Crop Sales	148.56	207.50	153.96	108.30	86.99	45.50
Insurance Receipts	0	0.62	2.49	9.90	5.63	26.59
VALUE OF PRODUCTION	148.56	208.11	156.46	118.20	92.62	72.09
	4.40/Bu	4.15/Bu	4.60/Bu	4.96/Bu	4.79/Bu	7.26/Bu
VARIABLE COST						
Materials	34.84	43.70	34.93	39.40	23.87	20.97
Hail/Crop Insurance	2.75	3.84	2.55	2.79	2.79	5.24
Fuel and Repairs	18.87	14.92	14.31	11.01	10.85	10.65
Paid Labour	2.70	1.71	4.08	4.57	2.03	4.53
Operator Labour	11.69	12.03	15.12	10.91	8.11	10.78
Miscellaneous	10.02	5.54	7.30	9.98	5.96	9.14
TOTAL VARIABLE COST	80.87	81.74	78.29	78.66	53.61	61.31
	2.40/Bu	1.63/Bu	2.30/Bu	3.30/Bu	2.77/Bu	6.17/Bu
CAPITAL COST						
Cash Rent/Crop Share	6.58	26.55	10.90	16.52	7.34	6.47
Taxes and Insurance	3.99	2.26	3.20	2.41	1.44	3.19
Equip.,Bldg. Depreciation	23.96	25.13	23.88	20.13	18.12	14.79
Paid Capital Interest	11.80	4.40	11.44	9.74	5.49	7.69
TOTAL CAPITAL COST	46.33	58.34	49.43	48.79	32.39	32.14
TOTAL COST	127.20	140.08	127.71	127.45	86.00	93.46
	3.77/Bu	2.80/Bu	3.76/Bu	5.34/Bu	4.45/Bu	9.41/Bu
Return to Capital (Cont. Margin)	67.69	126.38	78.17	39.55	39.01	10.78
Return to Equity	21.36	68.04	28.74	-9.25	6.62	-21.37
Return to Equity (%)	4.82%	13.16%	5.2%	-2.39%	1.62%	-4.86%
Equity	80%	92%	84%	80%	86%	86%
Debt Capacity ($/Ac)	433.84	845.39	510.59	252.96	256.01	51.67
Production Value of Land ($/Ac)	305.09	872.20	420.50	99.66	140.81	-90.69
Market Value of Land ($/Ac)	378.44	936.47	529.26	493.60	331.45	635.74
Machinery Investment ($/Ac)	209.73	219.86	210.80	174.35	156.02	123.30

acre due to a greater degree of rented land within the Barrhead study group. Also the Barrhead group had the highest machinery investment at $219.86 per acre resulting in the highest depreciation cost. The Barrhead group with their high equity of 92 per cent had the lowest paid capital interest cost of $4.40 per acre. It is interesting to note that the Peace River and Vermilion regions had very similar cost structures on both a per acre and per bushel basis.

Total production costs for wheat production ranged from a low of $86.00 per acre ($4.45 per bushel) in the Calgary (Oyen-Hanna) area to $140.08 per acre ($2.80 per bushel) in the Barrhead region. Return to capital (contribution margin) ranged from $10.78 per acre in the Lethbridge dryland region to $126.38 per acre in the Barrhead region. The Calgary (Oyen-Hanna), Peace River, Vermilion, and Barrhead regions all experienced positive returns to equity in the order of 1.62, 4.82, 5.20 and 13.16 per cent, respectively. Returns were short of covering all production costs in the Red Deer (Stettler-Coronation) region ($9.25 per acre) and Lethbridge dryland region ($21.37 per acre). Refer to Table 4 for more detail on debt capacity, market and productive values for land and machinery investment.

Barley Production

Referring to Table 5, barley yields in 1984 ranged from 17.58 bushels in the Calgary (Oyen-Hanna) region to 66.73 bushels in the Barrhead region. The value of production ranged from $60.28 in the Calgary (Oyen-Hanna) to $188.30 in the Barrhead Region. Crop insurance receipts were significant in both Calgary (Oyen-Hanna) and Lethbridge dryland regions averaging $12.28 and $29.77 per acre, respectively. In contrast to wheat production, a narrow range of variable costs existed for barley production, from $70.19 in the Lethbridge dryland region to $83.78 in the Barrhead region. Once again high material costs in the Barrhead region accounted for the difference. Due to the large variation in barley yields variable costs on a per bushel basis ranged from $1.26 in the Barrhead region to $4.10 in the Calgary (Oyen-Hanna) region.

Capital costs for barley production ranged from $27.88 in the Calgary (Oyen-Hanna) region to $51.86 in the Vermilion region. The Barrhead region reported the highest cash rent/crop share and depreciation costs. Paid capital interest was relatively high in the Peace River and Vermilion regions at $11.31

TABLE 5: REGIONAL COMPARISON OF COSTS AND RETURNS FOR BARLEY PRODUCTION - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)
Number of Enterprise	10	40	39	5	4	31
Average Acreage	175.5	371.6	207.1	215.0	96.25	125.63
Average Yield (Bu/Acre)	39.73	66.73	47.78	36.83	17.58	19.93
	- Dollars Per Acre - - - - - - - - - - - -					
Crop Sales	104.84	178.87	129.24	112.71	48.00	59.08
Insurance Receipts	0	9.43	2.95	0	12.28	29.77
VALUE OF PRODUCTION	104.84	188.30	132.19	112.71	60.28	88.85
	2.64/Bu	2.82/Bu	2.77/Bu	3.06/Bu	3.43/Bu	4.46/Bu
VARIABLE COST						
Materials	27.18	43.67	35.39	34.68	31.59	28.73
Hail/Crop Insurance	2.61	3.85	3.05	2.23	8.58	4.93
Fuel and Repairs	16.84	15.97	15.77	9.33	12.32	12.22
Paid Labour	3.51	2.16	2.94	8.15	4.27	3.62
Operator Labour	11.49	12.83	15.61	7.39	8.04	13.40
Miscellaneous	10.50	5.30	7.08	13.95	7.34	7.29
TOTAL VARIABLE COST	72.13	83.78	79.84	75.73	72.14	70.19
	1.82/Bu	1.26/Bu	1.67/Bu	2.06/Bu	4.10/Bu	3.52/Bu
CAPITAL COST						
Cash Rent/Crop Share	3.99	13.46	11.58	6.28	2.86	6.02
Taxes and Insurance	3.57	3.34	2.96	2.95	1.91	3.50
Equip.,Bldg. Depreciation	24.51	27.03	26.92	22.80	16.56	16.05
Paid Capital Interest	11.31	5.59	10.39	7.72	6.56	5.71
TOTAL CAPITAL COST	43.38	49.43	51.86	39.75	27.88	31.29
TOTAL COST	115.50	133.21	131.70	115.48	100.02	101.48
	2.91/Bu	2.00/Bu	2.76/Bu	3.14/Bu	5.69/Bu	5.09/Bu
Return to Capital (Cont. Margin)	32.72	104.52	52.35	36.98	-11.85	18.65
Return to Equity	-10.66	55.10	0.49	-2.77	-39.74	-12.63
Return to Equity (%)	-2.24%	8.29%	0.09%	-0.52%	-10.94%	-2.25%
Equity	83%	92%	85%	88%	82%	88%
Debt Capacity ($/Ac)	198.50	689.12	336.36	231.77	-93.74	103.18
Productive Value of Land ($/Ac)	-35.10	655.44	154.01	49.27	-316.62	-24.13
Market Value of Land ($/Ac)	370.26	824.98	522.66	477.03	351.66	643.43
Machinery Investment ($/Ac)	215.52	234.43	238.32	185.41	137.21	131.03

and $10.39 per acre, respectively. Total production costs ranged from $100.02 ($5.69 per bushel) in the Calgary (Oyen-Hanna) region to $133.21 ($2.00 per bushel) in the Barrhead region. Only two regions in 1984 - Barrhead and Vermilion - were able to cover all production costs. Their returns to equity were $55.10 per acre (8.29 per cent) and $0.49 per acre (0.09 per cent), respectively. All other areas reported production costs exceeding returns ranging from $2.77 per acre in the Red Deer (Stettler-Coronation) region to $39.74 per acre in the Calgary (Oyen-Hanna) region. The range in equity levels for farms with barley production ranged from 82 per cent in the Calgary (Oyen-Hanna) region to 92 per cent in the Barrhead region. Machinery investment ranged from $131.03 per acre in the Lethbridge dryland region to $238.32 in the Vermilion region.

Canola Production

Group average costs and returns data on canola production are presented in Table 6. There were an insufficient number of farms growing canola in the Calgary (Oyen-Hanna) region to establish a production cost schedule. On a regional level, canola yields in 1984 ranged from 7.93 bushels in the Lethbridge dryland region to 28.59 bushels in the Barrhead region. Value of production for the Lethbridge dryland farms averaged $96.10 (33.8 per cent was in the form of crop insurance receipts) compared to the $246.24 per acre reported by the Barrhead farms.

Variable costs ranged from a low of $71.94 per acre in the Lethbridge dryland region to $84.89 in the Vermilion region. As can be seen the need for high production relative to cost is very significant. For example, in the Lethbridge dryland region the variable cost associated with the 7.93 bushel yield was $9.08 per bushel as compared to the cost of $2.89 per bushel in the Barrhead region where yields averaged 28.59 bushels.

Capital costs for canola production ranged from $24.86 in the Lethbridge dryland region to $58.62 in the Barrhead region. Again, the Barrhead region reported the highest cash rent/crop share ($23.37 per acre) and depreciation costs ($26.54 per acre). Although the Barrhead region had the highest per acre production cost, their relatively high yield gave them the lowest production cost on a per bushel basis of $4.94. As can be observed from Table 6, the

TABLE 6: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CANOLA PRODUCTION - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	LETHBRIDGE (DRYLAND)
Number of Enterprise	10	30	48	17	11
Average Acreage	202.01	213.57	259.06	199.03	118.64
Average Yield (Bu/Acre)	20.65	28.59	23.71	16.43	7.93
	- - - - - - - - - - - Dollars Per Acre - - - - - - - - - - -				
Crop Sales	165.20	232.06	189.64	147.51	63.64
Insurance Receipts	0	14.18	6.22	16.13	32.46
VALUE OF PRODUCTION	165.20	246.24	195.86	163.64	96.10
	8.00/Bu	8.61/Bu	8.26/Bu	9.96/Bu	12.13/Bu
VARIABLE COST					
Materials	31.41	42.96	39.34	38.93	29.27
Hail/Crop Insurance	3.93	5.46	4.50	4.64	5.66
Fuel and Repairs	17.52	14.95	15.46	10.40	10.85
Paid Labour	4.72	1.46	3.40	5.01	5.67
Operator Labour	10.27	11.63	15.17	11.06	12.12
Miscellaneous	11.25	6.30	7.02	13.22	8.37
TOTAL VARIABLE COST	79.10	82.76	84.89	83.26	71.94
	3.83/Bu	2.89/Bu	3.58/Bu	5.07/Bu	9.08/Bu
CAPITAL COST					
Cash Rent/Crop Share	4.19	23.37	14.15	16.15	4.70
Taxes and Insurance	3.74	3.24	3.14	2.57	3.52
Equip.,Bldg. Depreciation	24.93	26.54	24.37	19.66	12.30
Paid Capital Interest	15.81	5.47	9.94	13.88	4.35
TOTAL CAPITAL COST	48.68	58.62	51.59	52.27	24.86
TOTAL COST	127.77	141.37	136.48	135.53	96.80
	6.19/Bu	4.94/Bu	5.76/Bu	8.25/Bu	12.21/Bu
Return to Capital (Cont. Margin)	86.10	163.49	110.97	80.38	24.16
Return to Equity	37.43	104.87	59.38	28.11	-0.70
Return to Equity (%)	8.47%	16.08%	12.01%	5.96%	-0.19%
Equity	77%	92%	84%	75%	88%
Debt Capacity ($/Ac)	560.94	1091.46	734.46	529.96	140.62
Productive Value of Land ($/Ac)	446.07	1183.85	708.26	461.61	55.42
Market Value of Land ($/Ac)	378.03	889.83	519.25	487.29	684.67
Machinery Investment ($/Ac)	220.62	232.59	216.25	207.11	100.78

Lethbridge dryland region was exclusive in having a negative return to equity (-0.19 per cent). The return to equity for the remaining four regions ranged from $28.11 per acre (5.96 per cent) in the Red Deer (Stettler-Coronation) region to $104.87 per acre (16.08 per cent) in the Barrhead region. As a note of interest, the productive value of land for the canola crop in the Barrhead region was calculated to be $1183.85 per acre and compares to the average market value of $889.83 per acre. Machinery investment ranged from $100.78 in the Lethbridge dryland region to $232.59 in the Barrhead region.

Oats Production

Oats production is not considered a major crop on grain farms since it is more often grown on farms having a livestock enterprise where the grain is used in the feeding program. A total of 44 farms or 40.7 per cent of the dryland study group grew oats in 1984. Data on oats production is not available for the Peace River region. As indicated in Table 7, the average acreage of oats was considerably less than the acreages for wheat, barley, and canola. Provincially in 1984, oats occupied only 7.2 per cent of the total area for these four main crops. Yields in 1984 ranged from 6.04 bushels in the Lethbridge dryland region to 81.71 bushels in the Barrhead region. The value of production ranged from $49.25 in the Lethbridge dryland region to $163.59 in the Barrhead region.

Variable costs ranged from $47.41 in the Lethbridge dryland region to $85.24 in the Vermilion region. Material costs along with machine operation and labour accounted for the higher cost observed in the Vermilion region. Variable cost on a per bushel basis in the Barrhead region was relatively low at $0.79. Capital costs were also observed to have a wide range - from $28.52 in the Lethbridge dryland region to $53.59 in the Vermilion region, the difference of which was attricuted to paid capital interest and depreciation. As to returns to equity, the Barrhead region was exclusive in having the returns exceeding production costs. The Barrhead group averaged a return to equity of $49.31 per acre while the remaining regions reported negative returns ranging from $12.95 in the Red Deer Region to $31.71 in the Vermilion region. The Vermilion study group with oats production had an average equity level of 80 per cent and reported an average machinery investment of $260.83 per acre.

TABLE 7: REGIONAL COMPARISON OF COSTS AND RETURNS FOR OATS PRODUCTION - 1984

REGION	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)
Number of Enterprise	15	13	4	6	6
Average Enterprise Size (Acres)	83.5	74.62	71.25	127.17	118.50
Average Yield (Bu/Acre)	81.71	64.54	33.38	26.21	6.04
	- - - - - - - - - - - Dollars Per Acre - - - - - - - - - - -				
Crop Sales	160.39	103.41	54.08	43.59	21.08
Insurance Receipts	3.20	3.71	35.90	14.55	28.17
VALUE OF PRODUCTION	163.59	107.12	89.98	58.14	49.25
	2.00/Bu	1.66/Bu	2.70/Bu	2.22/Bu	8.15/Bu
VARIABLE COST					
Materials	30.66	32.79	26.30	19.62	22.86
Hail/Crop Insurance	2.07	2.09	3.25	1.20	0.87
Fuel and Repairs	14.33	18.61	12.96	12.35	9.58
Paid Labour	1.78	7.35	2.14	0.00	1.30
Operator Labour	11.12	15.37	12.03	12.12	9.00
Miscellaneous	4.20	9.03	3.04	2.48	3.80
TOTAL VARIABLE COST	64.16	85.24	59.72	47.77	47.41
	0.79/Bu	1.32/Bu	1.79/Bu	1.82/Bu	7.85/Bu
CAPITAL COST					
Cash Rent/Crop Share	10.60	2.45	15.14	2.01	2.82
Taxes and Insurance	3.79	4.12	3.45	2.02	4.40
Equip.,Bldg. Depreciation	29.28	30.14	20.66	21.01	17.06
Paid Capital Interest	6.44	16.88	3.96	5.73	4.24
TOTAL CAPITAL COST	50.12	53.59	43.21	30.77	28.52
TOTAL COST	114.28	138.83	102.93	78.54	75.93
	1.40/Bu	2.15/Bu	3.08/Bu	3.00/Bu	12.56/Bu
Return to Capital (Cont. Margin)	99.43	21.88	30.26	10.38	1.84
Return to Equity	49.31	-31.71	-12.95	-20.40	-26.68
Return to Equity (%)	6.02%	-4.85%	-2.64%	-4.05%	-3.25%
Equity	91%	80%	87%	90%	94%
Debt Capacity ($/Ac)	651.40	121.02	182.65	56.96	-17.45
Productive Value of Land ($/Ac)	587.73	-167.84	23.52	-162.73	-191.60
Market Value of Land ($/Ac)	867.41	515.66	448.25	291.15	767.30
Machinery Investment ($/Ac)	256.28	260.83	184.18	178.57	147.74

Summerfallow Costs

As indicated earlier in Table 3, the importance of summerfallow varied across the province. To illustrate, in relation to total cultivated acres, summerfallow occupied 9.6 per cent of the cultivated area in the Barrhead region and 33.8 per cent of the cultivated area in the Calgary (Oyen-Hanna) region.

Variable costs incurred in summerfallowing (Table 8) are primarily associated with machine operation and include fuel, repairs, and labour. A recent trend to chemical weed control can be verified as the dryland areas in the southern part of the province reported chemical expenses. Upon observation of the six farms with summerfallow in the Red Deer (Stettler-Coronation) region it was found that three of the farms used chemicals extensively thus contributing to the significant group average cost of $10.08 per acre. The total variable cost for this region was $26.45 per acre compared to the average of $15.16 for the remaining five study areas. A short term breakeven yield required to cover summerfallow costs can be calculated by dividing the variable cost by the price per bushel for the crop considered.

Capital costs associated with summerfallow ranged from $10.80 per acre in the Lethbridge dryland region to $18.40 per acre in the Vermilion region. A cash rent expense was reported for four of the six regions suggesting that some cash rent agreements do not provide consideration for the summerfallow year. Machinery depreciation, on average, represented 51.0 per cent of the capital cost while paid capital interest accounted for 29.8 per cent. Total summerfallow costs ranged from $25.28 per acre in the Lethbridge dryland region to $41.10 per acre in the Red Deer (Stettler-Coronation) region.

TABLE 8: REGIONAL COMPARISON OF COSTS AND RETURNS FOR SUMMERFALLOW - 1984

REGION	PEACE RIVER	BARRHEAD	VERMILION	RED DEER (STETTLER & CORONATION)	CALGARY (OYEN & HANNA)	LETHBRIDGE (DRYLAND)
Number of Enterprise	8	22	35	6	10	30
Average Enterprise Size (Acres)	203	127.63	183.44	238.42	390.73	357.10
Average Yield (Bu/Acre)						
	- - - - - - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - - - - - -					
Crop Sales						
Insurance Receipts						
VALUE OF PRODUCTION						
VARIABLE COST						
Materials				10.08	3.17	0.17
Hail/Crop Insurance						
Fuel and Repairs	7.80	7.70	6.41	5.30	4.09	5.05
Paid Labour	1.87	0.91	1.44	1.93	0.87	2.73
Operator Labour	5.43	5.63	6.38	5.99	3.05	4.51
Miscellaneous	2.19	1.34	1.57	3.15	1.47	2.02
TOTAL VARIABLE COST	17.29	15.58	15.80	26.45	12.65	14.48
CAPITAL COST						
Cash Rent/Crop Share	-	1.84	0.75	-	3.28	1.50
Taxes and Insurance	1.87	1.88	1.74	1.73	1.19	1.85
Equip.,Bldg. Depreciation	8.90	8.90	9.20	8.47	5.72	5.65
Paid Capital Interest	2.48	5.56	6.70	4.44	6.37	1.81
TOTAL CAPITAL COST	13.25	18.18	18.40	14.64	16.56	10.80
TOTAL COST	30.54	33.76	34.20	41.10	29.22	25.78
Return to Capital (Cont. Margin)	-17.29	-15.58	-15.80	-26.45	-12.65	-14.48
Return to Equity	-30.54	-33.76	-34.20	-41.10	-29.22	-25.28
Equity	94%	82%	87%	89%	70%	96%
Debt Capacity ($/Ac)	-	-	-	-	-	-
Productive Value of Land ($/Ac)	-	-	-	-	-	-
Market Value of Land ($/Ac)	353.94	781.58	554.22	591.89	335.82	568.34
Machinery Investment ($/Ac)	88.99	97.11	92.01	84.70	57.21	56.48

SECTION IV

SUMMARY OF COSTS AND RETURNS FOR IRRIGATED CROPS

The crop case study was expanded in 1984 to include the irrigated areas of southern Alberta. Cost and return data presented in this section are based on information collected from 25 irrigation farms in the Lethbridge region. As Table 9 indicates, soft wheat was the most extensively grown crop in the irrigated areas followed by alfalfa hay.

TABLE 9: 1984 IRRIGATED CROP ACRES

CROP	ACRES	% OF TOTAL
Soft Wheat	376,919	40.1
Barley	111,283	11.9
Oats	8,111	0.9
Other Grains	10,089	1.1
Total Oilseeds	70,206	7.5
Total Hay	183,572	19.5
Tame Pasture & Misc. Fodder	78,911	8.4
Sugar Beets	30,031	3.3
Potatoes	14,943	1.6
Other Specialty Crops	48,199	5.1
Summerfallow	5,924	.6
TOTAL IRRIGATED ACRES	938,988	100.0

Three crops, namely soft wheat, barley, and hay were grown on 71.5 per cent of the irrigated cropland in 1984. As to the study sample, the average farm consisted of 704.4 cultivated acres of which 47.6 per cent or 335.1 acres was represented by soft wheat. Sugar beets were second in importance on the study farms in terms of acres as it was grown on 11.7 per cent of the cultivated area. The average study farm had 30.3 acres of alfalfa hay.

Group average costs and returns for the four main crops grown in the Lethbridge irrigation area are presented in Table 10. The value of production ranged from $248.99 per acre for barley to $600.05 per acre for sugar beets. Sugar beets generally occupy less than 15 per cent of the seeded acreage and often contribute more than one-third of the total farm cash receipts. Grown under contract, sugar beets provide growers with cash flow at harvest time as they are delivered directly to the sugar processor at which time they receive an initial payment. Another crop which is grown for the cash market is alfalfa hay and in 1984 the acreage increased by 15 per cent over 1983. The value of production for the average hay crop yielding 4.57 tons was $390.58 per acre. The value of production for soft wheat was $306.33 per acre. As a result of the drought in 1984 use of the fairly limited irrigation equipment on higher valued specialty crops contributed to the below average yields for grains and oilseeds.

The variable costs of production varied just as greatly as the value of production for the four main crops ranging from $166.85 per acre for alfalfa hay to $440.03 per acre for sugar beets. Due to the nature of the sugar beet enterprise, relatively higher material, machinery fuel and repairs, and custom work costs were reported. Together, these three inputs totalled $356.89 per acre and accounted for 81 per cent of the total variable costs. The variable costs of production for soft wheat and barley were $182.28 and $174.69 per acre, respectively.

Along with the high investment for land, machinery and irrigation equipment are the associated high capital costs. The range in actual capital costs incurred in 1984 for the four main crops was $119.90 for barley production to $231.20 for sugar beet production. Depreciation costs in most cases was the most significant capital cost item and is related directly to the building and machinery investment as reported by the study participants. The average irrigation farm on study owned 73.9 per cent of the land base thereby reducing the impact of the cash rent/crop share cost. However, on some farms the cash rent/crop share represents a major expenditure. For example, the cash rent/-crop share for the farmers growing sugar beets on rented land averaged $134.17 per acre. Water and land taxes ranged from $13.37 for barley production to $18.74 for sugar beets. The equity levels on irrigation farms ranged from 66 per cent for soft wheat production to 79 per cent for barley production, well below the eighty per cent observed for the dryland farms. This, coupled with

TABLE 10: SUMMARY OF COSTS AND RETURNS FOR IRRIGATED CROPS - 1984

CROP	SOFT WHEAT	SUGAR BEETS	ALFALFA HAY	BARLEY
Number of Enterprise	37	29	12	11
Average Acreage	226.4	71.34	63.17	42.09
Average Yield (Bu/Acres)	70.28 Bu	17.14 Tonnes	4.57 Ton	77.15 Bu
	- - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - -			
Crop Sales	303.35	600.05	390.58	246.62
Insurance Receipts	2.98	0	0	2.37
VALUE OF PRODUCTION	306.33	600.05	390.58	248.99
	4.36/Bu	35.00/Tonne	85.43/Ton	3.23/Bu
VARIABLE COST				
Materials	61.46	159.48	24.07	53.71
Hail/Crop Insurance	10.17	5.31	0.27	6.70
Fuel and Repairs	37.13	93.44	51.47	39.99
Custom Work	18.85	103.97	28.77	7.99
Paid Labour	0.74	0.54	0.61	0.03
Operator Labour	29.85	30.41	34.03	46.72
Miscellaneous	24.08	46.88	27.63	19.55
TOTAL VARIABLE COST	182.28	440.03	166.85	174.69
	2.59/Bu	25.67/Tonne	36.50/Ton	2.26/Bu
CAPITAL COST				
Cash Rent/Crop Share	15.55	32.16	23.10	27.87
Taxes and Insurance	14.32	18.74	14.51	13.37
Equip.,Bldg. Depreciation	49.74	115.28	64.00	50.82
Paid Capital Interest	58.83	65.03	58.30	27.83
TOTAL CAPITAL COST	138.44	231.20	159.90	119.90
TOTAL COST	320.72	671.23	326.75	294.59
	4.56/Bu	39.15/Tonne	71.47/Ton	3.82/Bu
Return to Capital (Cont. Margin)	124.05	160.02	223.73	74.29
Return to Equity	-14.38	-71.18	63.83	-45.61
Return to Equity (%)	-1.47%	-4.64%	5.78%	-4.24%
Equity	66%	73%	69%	79%
Debt Capacity ($/Ac)	747.38	962.31	1425.04	414.90
Productive Value of Land ($/Ac)	405.83	-49.84	1129.06	7.67
Market Value of Land ($/Ac)	1177.31	1190.94	1210.55	1241.04
Machinery Investment ($/Ac)	442.56	1104.33	599.37	461.74

the high investment results in a relatively significant paid capital interest cost ranging from $27.83 per acre for barley production to $65.03 per acre for sugar beets.

Total production costs for barley, soft wheat, alfalfa hay, and sugar beets were $294.59, $320.72, $326.75 and $671.23 per acre, respectively. As to the four main crops, the alfalfa hay enterprise was exclusive in that returns exceeded costs. The return to equity for alfalfa hay was $63.83 per acre and had a percentage return to equity of 5.78. Returns were short of covering all costs for soft wheat, sugar beets, and barley by $14.38, $71.18 and $45.61 per acre, respectively. The alfalfa hay crop had the highest return to capital or contribution margin of $223.73 per acre. To maintain economic viability, cash costs must be covered in the short run. Returns over cash outflow for the soft wheat, sugar beet, and barley enterprises were $65.20, $74.50, and $51.95 per acre, respectively.

Based on market value, the estimated value of irrigated land ranged from $1,177.31 per acre for the soft wheat group to $1,241.04 for the barley group. Machinery investment per acre ranged from $442.56 for soft wheat production to $1,104.33 for sugar beets.

Table 11 summarizes the profitability of all crops surveyed in the Lethbridge irrigated area for which there were three or more observations. Tables 10, 12, and 13 provide a detailed breakdown of the cost items for each of these crops. In summary, four of the 12 enterprises surveyed had positive returns to equity (profit) in 1984 with corn silage being most profitable followed by dry beans, processing peas, and alfalfa hay. As to the short run breakeven (cash outflow) situation, only three crops were observed to have negative returns over cash costs ranging from -$51.25 per acre for canola to -$1.39 per acre for flax.

TABLE 11:

SUMMARY OF 1984 COSTS AND RETURNS FOR IRRIGATED CROPS - LETHBRIDGE REGION

CROP	NUMBER OF ENTERPRISES	VALUE OF PRODUCTION	VARIABLE COSTS	TOTAL COSTS	RETURN TO EQUITY ($)	RETURN OVER CASH COSTS
Soft Wheat	37	306.33	182.28	320.72	-14.38 (0)	65.20
Sugar Beets	29	600.05	440.03	671.23	-71.18 (0)	74.50
Alfalfa Hay	12	390.58	166.85	326.75	63.83 (5.78)	161.85
Barley	11	248.99	174.69	294.59	-45.61 (0)	51.95
Dry Peas	4	251.95	175.76	303.61	-51.66 (0)	27.15
Processing Peas	6	386.74	210.56	336.11	50.63 (6.09)	112.78
Dry Beans	5	469.29	255.56	400.28	69.00 (8.02)	162.06
Grain Corn	6	314.85	252.21	404.60	-89.75 (0)	-8.86
Canola	6	185.56	164.79	315.37	-129.81 (0)	-51.25
Flax	3	200.00	189.99	290.77	-90.77 (0)	-1.39
Feed Wheat	5	228.60	170.77	309.55	-80.95 (0)	0.27
Corn Silage	3	673.37	172.95	303.02	370.34 (86.19)	450.94

TABLE 12: SUMMARY OF COSTS AND RETURNS FOR IRRIGATED CROPS - 1984

CROP	DRY PEAS	PROCESSING PEAS	DRY BEANS	GRAIN CORN
Number of Enterprise	4	6	5	6
Average Acreage	90.0	44.50	102.83	205.80
Average Yield (Bu/Acres)	2029.5 Pounds	1.32 Ton	1906.03 Pounds	74.42 Bu
	- - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - -			
Crop Sales	251.95	350.38	469.29	314.85
Insurance Receipts	0	36.36	0	0
VALUE OF PRODUCTION	251.95	386.74	469.29	314.85
	0.12/lb	283.99/Ton	0.25/lb	4.23/Bu
VARIABLE COST				
Materials	50.41	90.18	97.49	88.86
Hail/Crop Insurance	7.52	8.21	18.48	17.47
Fuel and Repairs	34.43	30.65	58.87	59.90
Custom Work	31.37	36.86	19.93	43.40
Paid Labour	0.15	0.07	0.90	0
Operator Labour	37.52	25.96	31.91	13.14
Miscellaneous	14.36	18.63	27.98	29.44
TOTAL VARIABLE COST	175.76	210.56	255.56	252.21
	0.09/lb	160.06/Ton	0.13/lb	3.39/Bu
CAPITAL COST				
Cash Rent/Crop Share	0	9.76	36.63	9.54
Taxes and Insurance	13.41	14.93	9.78	15.56
Equip.,Bldg. Depreciation	41.29	36.19	61.14	67.75
Paid Capital Interest	73.15	64.67	37.17	59.54
TOTAL CAPITAL COST	127.85	125.55	144.72	152.39
TOTAL COST	303.61	336.11	400.28	404.60
	0.15/lb	255.50/Ton	0.21/lb	5.44/Bu
Return to Capital (Cont. Margin)	76.18	176.18	213.72	62.64
Return to Equity	-51.66	50.63	69.00	-89.75
Return to Equity (%)	-6.41%	6.09%	8.02%	-7.69%
Equity	53%	60%	74%	70%
Debt Capacity ($/Ac)	427.57	1098.27	1389.06	320.64
Productive Value of Land ($/Ac)	97.93	1044.32	1142.65	-458.32
Market Value of Land ($/Ac)	1075.00	1151.69	1063.70	1042.90
Machinery Investment ($/Ac)	390.58	333.99	584.34	594.42

TABLE 13: SUMMARY OF COSTS AND RETURNS FOR IRRIGATED CROPS - 1984

CROP	CANOLA	FLAX	FEED WHEAT	CORN SILAGE
Number of Enterprise	6	3	5	3
Average Acreage	99.17	236.67	54.0	103.33
Average Yield (Bu/Acres)	23.02 Bushels	17.61 Bushels	53.42 Bushesl	16.15 Ton
	- - - - - - - - - - - - Dollars Per Acre - - - - - - - - - -
Crop Sales	185.56	140.85	228.60	673.37
Insurance Receipts	0	59.15	0	0
VALUE OF PRODUCTION	185.56	200.00	228.60	673.37
	8.06/Bu	11.36/Bu	4.28/Bu	41.68/Ton
VARIABLE COST				
Materials	62.31	59.13	49.60	74.28
Hail/Crop Insurance	4.75	14.63	5.97	3.53
Fuel and Repairs	34.80	45.27	38.19	37.50
Custom Work	5.71	7.46	10.57	5.54
Paid Labour	0.06	0	0.14	0
Operator Labour	36.32	40.69	41.28	32.24
Miscellaneous	20.84	22.81	25.02	19.86
TOTAL VARIABLE COST	164.79	189.99	170.77	172.95
	7.16/Bu	10.79/Bu	3.20/Bu	10.71/Ton
CAPITAL COST				
Cash Rent/Crop Share	8.40	4.23	61.36	19.77
Taxes and Insurance	14.14	16.04	5.05	8.64
Equip.,Bldg. Depreciation	42.24	48.69	39.95	48.35
Paid Capital Interest	150.59	100.78	138.79	130.07
TOTAL CAPITAL COST	315.37	290.77	309.55	303.02
TOTAL COST	13.70/Bu	16.52/Bu	5.80/Bu	18.76/Ton
Return to Capital (Cont. Margin)	20.77	10.01	57.84	500.42
Return to Equity	-129.81	-90.77	-80.95	370.34
Return to Equity (%)	-24.94%	-7.24%	-17.10%	86.19%
Equity	41%	84%	74%	49%
Debt Capacity ($/Ac)	45.20	-41.07	359.54	3349.46
Productive Value of Land ($/Ac)	-409.68	-670.66	-6.44	3904.71
Market Value of Land ($/Ac)	974.37	1076.76	1154.63	756.45
Machinery Investment ($/Ac)	386.82	421.48	355.13	457.19

SECTION V

A COST COMPARISON OF SUMMERFALLOW CROPPING VERSUS STUBBLE CROPPING

As was indicated in Section III, the practice of summerfallow varied significantly across the province in terms of its proportion of the total cultivated area. Table 3, of Section III summarized the average farm surveyed in each region as to the crop rotation including summerfallow. As anticipated, summerfallowing is a general practice in the dryland areas of southern Alberta as the average farm in the Calgary (Oyen-Hanna) and the Lethbridge dryland areas summerfallowed 33.8 and 33.5 per cent of the cultivated area, respectively. In northern and north-central Alberta, the summerfallow portion of the cultivated area ranged from 9.6 per cent in the Barrhead region to 19.0 per cent in the Peace River region.

This section is designed to assist the individual producer in deciding whether stubble cropping is more advantageous than summerfallowing on his farm. The additional yield required to cover summerfallow costs in the short run and long run can be calculated by dividing the variable costs and total production costs for summerfallow, respectively, by the market price per bushel for the crop considered. Whether additional yield can be obtained on an individual farm basis would depend on a number of factors such as management, labour, operating cash available, machinery requirements, additional risk, degree of weather uncertainty, etc.

The study participants in the Red Deer (Stettler-Coronation) and the Calgary (Oyen-Hanna) regions were able to provide 1984 costs and returns data by land tenure and also by summerfallow crops versus stubble crops. This data which is based on a limited number of farms is presented in the following tables.

Wheat Production on Summerfallow Versus Stubble in the Calgary (Oyen-Hanna) Region

Group average costs and returns for wheat summerfallow, wheat stubble, and summerfallowing are presented in Table 14 for the Calgary (Oyen-Hanna) region. Based on the assumption that the benefits of summerfallowing are entirely utilized by the first crop, all summerfallow costs were added to the first crop grown on summerfallowed land.

The average yield for wheat grown on summerfallow was 21.44 bushels per acre, about 5.09 bushels more than the wheat grown on stubble. Value of production for wheat on summerfallow averaged $104.35 per acre compared to $76.43 for stubble on wheat.

Lower fertilizer and chemical costs reported for wheat on summerfallow were more than offset by the variable costs associated with summerfallowing. The variable costs for wheat on summerfallow averaged $62.23 per acre ($2.90 per bushel) compared to $59.16 ($3.62 per bushel) for wheat on stubble. Assuming the average market price for wheat at $4.50 per bushel, the additional yield required to cover the higher variable cost is 0.68 bushels. The capital cost structure for wheat on summerfallow and wheat on stubble was observed to be quite similar at $31.50 and $33.62 per acre, respectively. Capital costs for the 10 summerfallow enterprises averaged $16.57 per acre giving the two year wheat summerfallow enterprise a total capital cost of $48.07. The additional yield required to cover the capital costs associated with summerfallowing is 3.21 bushels per acre.

The total production costs for wheat on summerfallow including the summerfallow year was $110.30 per acre, about $17.52 more than the production costs for wheat stubble. A break-even yield to cover the additional summerfallow costs assuming wheat at $4.50 per bushel would be 3.89 bushels per acre. As observed, wheat summerfallow outyielded wheat stubble on the Calgary (Oyen-Hanna) study farms in 1984 by 5.09 bushels per acre. As a result, the return to capital for wheat summerfallow was $42.12 compared to $17.27 for wheat stubble. The value of production was insufficient in covering all production costs for both enterprises by $5.95 per acre for wheat summerfallow and $16.36 per acre for wheat stubble.

TABLE 14

COSTS AND RETURNS COMPARISON FOR WHEAT PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - CALGARY (OYEN-HANNA) REGION

REGION	WHEAT SUMMERFALLOW	WHEAT STUBBLE	SUMMERFALLOW
Number of Enterprises	9	8	10
Average Acreage	403.78	325.12	390.73
Average Yield (Bu/Acre)	21.44	16.35	
	- - - - - - - - Dollars Per Acre - - - - - - - -		
Crop Sales	98.37	71.28	
Insurance Receipts	5.98	5.15	
Value of Production	104.35	76.43	
	(4.87/Bu)	((4.67/Bu)	
VARIABLE COST			
Materials	18.88	30.77	3.17
Hail/Crop Insurance	3.53	1.75	
Fuel and Repairs	10.87	10.83	4.09
Paid Labour	2.55	1.30	.87
Operator Labour	7.83	8.50	3.05
Miscellaneous	5.92	6.01	1.47
Summerfallow Var. Costs	12.65		
TOTAL VARIABLE COST	62.23	59.16	12.65
	(2.90/Bu)	(3.62/Bu)	
CAPITAL COST			
Cash Rent/Crop Share	7.30	7.40	3.28
Taxes and Insurance	1.46	1.40	1.19
Equip.,Bldg. Depreciation	17.06	19.60	5.72
Paid Capital Interest	5.68	5.23	6.37
Summerfallow Cap. Cost	16.57		
TOTAL CAPITAL COST	48.07	33.62	16.57
TOTAL COST	110.30	92.78	29.22
	(5.14/Bu)	(5.68/Bu)	
Return to Capital (Cont. Margin)	42.12	17.27	-12.65
Return to Equity	-5.95	-16.36	-29.22

Wheat Production on Summerfallow Versus Stubble in the Red Deer (Stettler - Coronation) Region

A comparison of costs and returns for wheat production on summerfallow and stubble in the Red Deer (Stettler-Coronation) region is presented in Table 15. As a cautionary note, there were only three wheat summerfallow enterprises analyzed in comparison to 11 for wheat stubble. The average yield for wheat summerfallow was 35.43 bushels compared to the 23.85 bushels for wheat stubble. Returns for wheat summerfallow were almost 39 per cent higher at $164.23 per acre relative to the wheat stubble at $118.20 per acre.

The variable costs associated with summerfallow were much more significant for the Red Deer (Stettler - Coronation) study group due to the higher incidence of chemical use. Approximately 38 per cent of the total variable cost of $26.45 per acre for summerfallow is accounted for by chemicals. Variable costs for the wheat on summerfallow over the two year period totalled $87.59, about $8.93 more than the average for wheat on stubble. With wheat valued at $4.50 per bushel, the additional yield increase required to cover the additional variable cost would be approximately two bushels. The total production for wheat on summerfallow including the summerfallow year was $148.59 per acre compared to $127.45 for wheat on stubble. The additional yield required to cover all additional costs associated with summerfallow was calculated to be 4.7 bushels per acre. This is well below the 11.58 bushel difference in yield reported for the wheat summerfallow versus wheat stubble in 1983. Returns to capital for wheat on summerfallow were $76.64 compared to $39.55 for wheat on stubble. Return to equity for wheat on summerfallow was $15.64 per acre while production costs exceeded the value of production for wheat on stubble by $9.25 per acre.

Canola Production on Summerfallow Versus Stubble in the Red Deer (Stettler-Coronation) Region

Although canola can be grown on stubble land many prefer to grow it on summerfallow where it is easier to attain a firm moist seedbed. A total of 17 canola enterprises were analyzed in the Red Deer (Stettler-Coronation) region relative to the 1984 crop year. Canola on summerfallow outyielded canola on stubble by 6.15 bushels per acre. The value of production for canola on

TABLE 15:

COSTS AND RETURNS COMPARISON FOR WHEAT PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - RED DEER (STETTLER-CORONATION) REGION

REGION	WHEAT SUMMERFALLOW	WHEAT STUBBLE	SUMMERFALLOW
Number of Enterprises	3	11	6
Average Acreage	148.33	361.00	238.42
Average Yield (Bu/Acre)	35.43	23.85	
	- - - Dollars Per Acre - - -		
Crop Sales	163.11	108.30	
Insurance Receipts	1.12	9.90	
Value of Production	164.23	118.20	
	(4.64/Bu)	4.96/Bu)	
VARIABLE COST			
Materials	31.06	39.40	10.08
Hail/Crop Insurance	4.77	2.79	
Fuel and Repairs	12.29	11.01	5.30
Paid Labour	.01	4.57	1.93
Operator Labour	11.57	10.91	5.99
Miscellaneous	1.44	9.98	3.15
Summerfallow Var. Costs	26.45		
TOTAL VARIABLE COST	87.59	78.66	26.45
	(2.47/Bu)	(3.30/Bu)	
CAPITAL COST			
Cash Rent/Crop Share	21.23	16.52	
Taxes and Insurance	3.21	2.41	1.73
Equip.,Bldg. Depreciation	17.14	20.13	8.47
Paid Capital Interest	4.78	9.74	4.44
Summerfallow Cap. Costs	14.64		
TOTAL CAPITAL COST	61.00	48.79	14.64
TOTAL COST	148.59	127.45	41.10
	(4.19/Bu)	(5.34/Bu)	
Return to Capital (Cont. Margin)	76.64	39.55	-26.45
Return to Equity	15.64	-9.25	-41.10

TABLE 16: COSTS AND RETURNS COMPARISON FOR CANOLA PRODUCTION ON SUMMERFALLOW VERSUS STUBBLE - RED DEER (STETTLER-CORONATION) REGION

REGION	CANOLA SUMMERFALLOW	CANOLA STUBBLE	SUMMERFALLOW
Number of Enterprises	7	10	6
Average Acreage	145.36	236.60	238.42
Average Yield (Bu/Acre)	20.74	14.59	
	- - - Dollars Per Acre - - -		
Crop Sales	189.04	129.71	
Insurance Receipts	24.47	12.56	
Value of Production	213.51	142.27	
	(10.29/Bu)	(9.75/Bu)	
VARIABLE COST			
Materials	28.47	43.41	10.08
Hail/Crop Insurance	5.39	4.31	
Fuel and Repairs	12.79	9.37	5.30
Paid Labour	4.08	5.41	1.93
Operator Labour	15.49	9.15	5.99
Miscellaneous	14.72	12.61	3.15
Summerfallow Var. Costs	26.45		
TOTAL VARIABLE COST	107.39	84.26	26.45
	(5.18/Bu)	(5.77/Bu)	
CAPITAL COST			
Cash Rent/Crop Share	34.42	8.32	
Taxes and Insurance	3.17	2.32	1.73
Equip.,Bldg. Depreciation	23.96	17.82	8.47
Paid Capital Interest	9.72	15.66	4.44
Summerfallow Cap. Cost	14.64		
TOTAL CAPITAL COST	85.91	44.13	14.64
TOTAL COST	193.30	128.38	41.10
Return to Capital	106.12	58.02	-26.45
Return to Equity	20.21	13.89	-41.10

summerfallow averaged $213.51 per acre compared to $142.27 for canola on stubble (shown on Table 16). Insurance receipts were significant averaging $24.47 for canola on summerfallow and $12.56 for canola on stubble.

The material costs for canola on summerfallow were considerably lower at $28.47 per acre compared to $43.41 per acre for canola on stubble. Total variable costs for canola on summerfallow exceeded canola on stubble costs by $23.13 per acre. Assuming a price for canola of $8.00 per bushel, an additional yield of 2.89 bushels per acre for canola summerfallow is required to cover the higher variable costs.

The capital cost structure for canola on summerfallow was observed to be appreciably higher in relation to canola on stubble. Capital costs for summerfallow together with high cash rent/crop share and depreciation accounts for the $41.78 per acre difference. Total production cost for canola on summerfallow averaged $193.30 per acre compared with $128.38 for canola on stubble. The incremental canola yield required to cover the additional costs on summerfallow was calculated to be 8.12 bushels per acre.

The returns to capital for canola on summerfallow was $106.12 per acre compared to $58.02 for canola on stubble. Due to the difference in the canola price received coupled with the crop insurance receipts, the canola on summerfallow enterprise had a return to equity of $20.21 per acre as compared to $13.89 per acre for canola on stubble.

SECTION VI

A COMPARISON OF CROP ALTERNATIVES BY REGION

Although most grain farms follow a rotation in their cropping program, there still remains some flexibility in deciding which crops should be grown and their respective acreage. This section is designed to present a comparison of the main crops analyzed in each of the dryland regions surveyed in 1984. For the purpose of this analysis no reference will be made to oats production as only a few enterprises were analyzed and the average acreage per farm was less than significant relative to wheat, barley, and canola production. Refer to Section IV for crop alternative data for the Lethbridge irrigation region.

Peace River Region

Table 17 presents costs and returns data for the main crops surveyed in the Peace River region. Spring wheat production was the most significant crop as 16 enterprises averaging 196.37 acres were analyzed for the 10 farms on the study.

The yields reported on the study farms are well above the averages reported for the Peace River region. Canola production proved to be most profitable as the 20.65 bushel yield provided growers with a value of production of $165.20 per acre. Wheat production which has a cost structure very similar to canola had a value of production of $148.56 per acre followed by barley at $104.84 per acre.

Variable costs per acre were observed to be quite similar for wheat and canola at $80.87 and $79.10 per acre, respectively. Barley production with lower material, crop insurance, and fuel and repair costs had the lowest variable cost at $72.13 per acre.

The capital costs for canola production amounted to $48.68 per acre and were relatively high due to the higher depreciation costs and paid capital interest. Farms growing canola had an average equity of 77 per cent compared to 80 per cent for farms with wheat and 83 per cent for farms with barley. Total production costs ranged from $115.50 for barley to $127.77 for canola, a variation of 10.6 per cent.

TABLE 17: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE PEACE RIVER REGION - 1984

CROP	SPRING WHEAT	BARLEY	CANOLA
Number of Enterprise	16	10	10
Average Acreage	196.37	175.5	202.01
Average Yield (Bu/Acre)	33.76	39.73	20.65
	- - - - - - Dollars Per Acre - - - - - -		
Crop Sales	148.56	104.84	165.20
Insurance Receipts	0	0	0
VALUE OF PRODUCTION	148.56	104.84	165.20
	4.40/Bu	2.64/Bu	8.00/Bu
VARIABLE COST			
Materials	34.84	27.18	31.41
Hail/Crop Insurance	2.75	2.61	3.93
Fuel and Repairs	18.87	16.84	17.52
Paid Labour	2.70	3.51	4.72
Operator Labour	11.69	11.49	10.27
Miscellaneous	10.02	10.50	11.25
TOTAL VARIABLE COST	80.87	72.13	79.10
	2.40/Bu	1.82/Bu	3.83/Bu
CAPITAL COST			
Cash Rent/Crop Share	6.58	3.99	4.19
Taxes and Insurance	3.99	3.57	3.74
Equip.,Bldg. Depreciation	23.96	24.51	24.93
Paid Capital Interest	11.80	11.31	15.81
TOTAL CAPITAL COST	46.33	43.38	48.68
TOTAL COST	127.20	115.50	127.77
	3.77/Bu	2.91/Bu	6.19/Bu
Return to Capital (Cont. Margin)	67.69	32.72	86.10
Return to Equity	21.36	-10.66	37.43
Return to Equity (%)	4.82%	-2.24%	8.47%
Equity	80%	83%	77%
Debt Capacity ($/Ac)	433.84	198.50	560.94
Productive Value of Land ($/Ac)	305.09	-35.10	446.07
Market Value of Land ($/Ac)	378.44	370.26	378.03
Machinery Investment ($/Ac)	209.73	215.52	220.62

Canola and wheat production were profitable in 1984 among the study farms with returns to equity averaging $37.43 per acre (8.47 per cent) and $21.36 (4.82 per cent) per acre, respectively. Production costs exceeded the value of production for barley by $10.66 per acre. It is interesting to note that the productive value of land for canola production exceeded the market value by $68.04 per acre. The machinery investment ranged from $209.73 for wheat production to $220.62 for canola production.

Barrhead Region

Presented in Table 18 are costs and return data for the three main crops analyzed in the Barrhead region. Yields and the associated returns for all crops surveyed were observed to be the highest in the Barrhead region in 1984. Barley production was the most significant crop on the study farms accounting for 50.9 per cent of the cultivated area. The value of production ranged from $188.30 per acre for barley to $246.24 per acre for canola.

The variable cost structure for the three main crops were very similar ranging from $81.74 for wheat to $83.78 for barley. There was more variation in the capital cost structure mainly because of the variation in the cash rent/crop share cost which is associated with the value of production. Total production costs ranged from $133.21 for barley to $141.37 for canola. For such similar cost structures it can be said that the return to equity (profit) is influenced to a greater degree not by the cost structure but rather by the value of production. Therefore, for any crop showing a high return it would be expected that a high yield and price be associated with it as well.

Due to the variation in the value of production, return to capital varied from $104.52 per acre for barley to $163.49 for canola. Returns to equity ranged from $55.10 for barley to $104.87 for canola. Experssed, as a percentage, returns to equity were 8.29, 13.16 and 16.08 per cent for barley, wheat, and canola, respectively. The productive value of land ranged from $655.44 for barley to $1,183.85 for canola.

TABLE 18: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE BARRHEAD REGION - 1984

CROP	SPRING WHEAT	BARLEY	CANOLA	OATS
Number of Enterprise	19	40	30	15
Average Acreage	203.39	371.6	213.57	83.5
Average Yield (Bu/Acre)	50.12	66.73	28.59	81.71
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -			
Crop Sales	207.50	178.87	232.06	160.39
Insurance Receipts	0.62	9.43	14.18	3.20
VALUE OF PRODUCTION	208.11	188.30	246.24	163.59
	4.15/Bu	2.82/Bu	8.61/Bu	2.00/Bu
VARIABLE COST				
Materials	43.70	43.67	42.96	30.66
Hail/Crop Insurance	3.84	3.85	5.46	2.07
Fuel and Repairs	14.92	15.97	14.95	14.33
Paid Labour	1.71	2.16	1.46	1.78
Operator Labour	12.03	12.83	11.63	11.12
Miscellaneous	5.54	5.30	6.30	4.20
TOTAL VARIABLE COST	81.74	83.78	82.76	64.16
	1.63/Bu	1.26/Bu	2.89/Bu	0.79/Bu
CAPITAL COST				
Cash Rent/Crop Share	26.55	13.46	23.37	10.60
Taxes and Insurance	2.26	3.34	3.24	3.79
Equip.,Bldg. Depreciation	25.13	27.03	26.54	29.28
Paid Capital Interest	4.40	5.59	5.47	6.44
TOTAL CAPITAL COST	58.34	49.43	58.62	50.12
TOTAL COST	140.08	133.21	141.37	114.28
	2.80/Bu	2.00/Bu	4.94/Bu	1.40/Bu
Return to Capital (Cont. Margin)	126.38	104.52	163.49	99.43
Return to Equity	68.04	55.10	104.87	49.31
Return to Equity (%)	13.16%	8.29%	16.08%	6.02%
Equity	92%	92%	92%	91%
Debt Capacity ($/Ac)	845.39	689.12	1091.46	651.40
Productive Value of Land ($/Ac)	872.20	655.44	1183.85	587.73
Market Value of Land ($/Ac)	936.47	824.98	889.83	867.41
Machinery Investment ($/Ac)	219.86	234.43	232.59	256.28

Vermilion Region

Table 19 presents costs and returns for the main crops surveyed in the Vermilion region. Canola and wheat production were equally important crops in 1984 in the Vermilion region as 56 wheat enterprises averaging 274.41 acres and 48 canola enterprises averaging 259.06 acres were analyzed for the 37 farms on study. Yield for the three main crops averaged 34.01 bushels for wheat, 47.78 bushels for barley and 23.71 bushels for canola. Value of production was highest for canola at $195.86 per acre followed by wheat at $156.46 per acre and barley at $132.19 per acre.

The variable costs for canola were higher relative to wheat and barley due to higher material and crop insurance costs. Capital costs among the three main crops were quite similar with the exception of cash rent/crop share. Total production costs amounted to $127.71 for spring wheat, $131.70 for barley and $136.48 for canola. Despite the high cost structure observed for canola it had the highest return to equity of $59.38 per acre or 12.01 per cent. This was followed by spring wheat which had a return to equity of $28.74 per acre (5.2 per cent) and barley at $0.49 per acre (0.09 per cent).

Similar to the Peace River and Barrhead regions, the productive value of land for canola production exceeded the market value in the Vermilion region. The study results for the three most northerly regions - Peace River, Barrhead, Vermilion - were identical in that canola production was the most profitable enterprise followed by wheat and then barley.

Red Deer (Stettler-Coronation) Region

Spring wheat and canola production were equally as important in the Red Deer (Stettler-Coronation) region as 11 wheat enterprises averaging 361.00 acres and 17 canola enterprises averaging 199.03 acres were analyzed on the seven study farms. As indicated in Table 20, yields on these farms were below those reported in the more northerly regions as all of these farms were located in the brown soil zone. Average yields in 1984 were 23.85, 36.83, and 16.43 bushels for wheat, barley and canola respectively. Canola had the highest value of production at $163.64 per acre.

TABLE 19: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE VERMILION REGION - 1984

CROP	SPRING WHEAT	BARLEY	CANOLA	OATS
Number of Enterprise	56	39	48	13
Average Acreage	274.41	207.1	259.06	74.62
Average Yield (Bu/Acre)	34.01	47.78	23.71	64.54
	- - - - - - - - - - Dollars Per Acre - - - - - - - -			
Crop Sales	153.96	129.24	189.64	103.41
Insurance Receipts	2.49	2.95	6.22	3.71
VALUE OF PRODUCTION	156.46	132.19	195.86	107.12
	4.60/Bu	2.77/Bu	8.26/Bu	1.66/Bu
VARIABLE COST				
Materials	34.93	35.39	39.34	32.79
Hail/Crop Insurance	2.55	3.05	4.50	2.09
Fuel and Repairs	14.31	15.77	15.46	18.61
Paid Labour	4.08	2.94	3.40	7.35
Operator Labour	15.12	15.61	15.17	15.37
Miscellaneous	7.30	7.08	7.02	9.03
TOTAL VARIABLE COST	78.29	79.84	84.89	85.24
	2.30/Bu	1.67/Bu	3.58/Bu	1.32/Bu
CAPITAL COST				
Cash Rent/Crop Share	10.90	11.58	14.15	2.45
Taxes and Insurance	3.20	2.96	3.14	4.12
Equip.,Bldg. Depreciation	23.88	26.92	24.37	30.14
Paid Capital Interest	11.44	10.39	9.94	16.88
TOTAL CAPITAL COST	49.43	51.86	51.59	53.59
TOTAL COST	127.71	131.70	136.48	138.83
	3.76/Bu	2.76/Bu	5.76/Bu	2.15/Bu
Return to Capital (Cont. Margin)	78.17	52.35	110.97	21.88
Return to Equity	28.74	0.49	59.38	-31.71
Return to Equity (%)	5.2%	0.09%	12.01%	-4.85%
Equity	84%	85%	84%	80%
Debt Capacity ($/Ac)	510.59	336.36	734.46	121.02
Production Value of Land ($/Ac)	420.50	154.01	708.26	-167.84
Market Value of Land ($/Ac)	529.26	522.66	519.25	515.66
Machinery Investment ($/Ac)	210.80	238.32	216.25	260.83

TABLE 20: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE RED DEER (STETTLER-CORONATION) REGION - 1984

CROP	SPRING WHEAT	BARLEY	CANOLA	OATS
Number of Enterprise	11	5	17	4
Average Acreage	361.00	215.0	199.03	71.25
Average Yield (Bu/Acre)	23.85	36.83	16.43	33.38
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -			
Crop Sales	108.30	112.71	147.51	54.08
Insurance Receipts	9.90	0	16.13	35.90
VALUE OF PRODUCTION	118.20	112.71	163.64	89.98
	4.96/Bu	3.06/Bu	9.96/Bu	2.70/Bu
VARIABLE COST				
Materials	39.40	34.68	38.93	26.30
Hail/Crop Insurance	2.79	2.23	4.64	3.25
Fuel and Repairs	11.01	9.33	10.40	12.96
Paid Labour	4.57	8.15	5.01	2.14
Operator Labour	10.91	7.39	11.06	12.03
Miscellaneous	9.98	13.95	13.22	3.04
TOTAL VARIABLE COST	78.66	75.73	83.26	59.72
	3.30/Bu	2.06/Bu	5.07/Bu	1.79/Bu
CAPITAL COST				
Cash Rent/Crop Share	16.52	6.28	16.15	15.14
Taxes and Insurance	2.41	2.95	2.57	3.45
Equip.,Bldg. Depreciation	20.13	22.80	19.66	20.66
Paid Capital Interest	9.74	7.72	13.88	3.96
TOTAL CAPITAL COST	48.79	39.75	52.27	43.21
TOTAL COST	127.45	115.48	135.53	102.93
	5.34/Bu	3.14/Bu	8.25/Bu	3.08/Bu
Return to Capital (Cont. Margin)	39.55	36.98	80.38	30.26
Return to Equity	-9.25	-2.77	28.11	-12.95
Return to Equity (%)	-2.39%	-0.52%	5.96%	-2.64%
Equity	80%	88%	75%	87%
Debt Capacity ($/Ac)	252.96	231.77	529.96	182.65
Productive Value of Land ($/Ac)	99.66	49.27	461.61	23.52
Market Value of Land ($/Ac)	493.60	477.03	487.29	448.25
Machinery Investment ($/Ac)	174.35	185.41	207.11	184.18

The variable costs ranged from $75.73 per acre for barley to $83.26 per acre for canola with the difference accounted for by material inputs and fuel/-repair costs. A wide variation in the capital cost structure was observed among the three crops ranging from $39.75 per acre for barley to $52.27 per acre for canola. This variation is attributable to the land tenure arrangement (cash rent/crop share) among the crops and the equity position of the study participants. For example, the canola study group reported an average cash rent/crop share of $16.15 per acre and paid capital interest of $13.88 per acre, compared to the barley group which had a cash rent/crop share expense of $6.28 per acre and paid capital interest of $7.72 per acre.

Total production costs were highest for canola production at $135.53 per acre followed by wheat at $127.45 per acre and barley at $115.48 per acre. Relating these costs to value of production, it was found that returns from wheat and barley production were both insufficient to cover all production costs. The value of production for canola production exceeded production costs by $28.11 per acre, a percentage return to equity of 5.96.

There was quite a variation in equity levels for the seven farms on study as the canola group had a 75 per cent equity level compared to 88 per cent for the barley group. Land productive values for all crops surveyed in 1984 were below their market values. Machinery investment on a per acre basis also varied from farm to farm as the wheat group had a machinery investment of $174.35 compared to $207.11 for canola.

Calgary (Oyen-Hanna) Region

As indicated earlier, over 53 per cent of the cultivated area on the study farms in the Calgary (Oyen-Hanna) area was in wheat production, most of which was grown on summerfallow. Although of much lesser importance, oats production was second followed by barley in terms of cultivated acres seeded. The average yield for spring wheat (Table 21) actually exceeded that reported for barley by approximately 2 bushels per acre. The average yields for the three main crops were 19.32, 17.58, and 26.21 bushels for wheat, barley, and oats, respectively. As to the return, the value of production for wheat averaged $92.62 per acre, well above the $60.28 reported for barley and $58.14 reported for oats.

TABLE 21: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE CALGARY (OYEN-HANNA) REGION - 1984

CROP	SPRING WHEAT	BARLEY	OATS
Number of Enterprise	17	4	6
Average Acreage	366.76	96.25	127.17
Average Yield (Bu/Acre)	19.32	17.58	26.21
	- - - - - - - Dollars Per Acre - - - - - - - - -		
Crop Sales	86.99	48.00	43.59
Insurance Receipts	5.63	12.28	14.55
VALUE OF PRODUCTION	92.62	60.28	58.14
	4.79/Bu	3.43/Bu	2.22/Bu
VARIABLE COST			
Materials	23.87	31.59	19.62
Hail/Crop Insurance	2.79	8.58	1.20
Fuel and Repairs	10.85	12.32	12.35
Paid Labour	2.03	4.27	0.00
Operator Labour	8.11	8.04	12.12
Miscellaneous	5.96	7.34	2.48
TOTAL VARIABLE COST	53.61	72.14	47.77
	2.77/Bu	4.10/Bu	1.82/Bu
CAPITAL COST			
Cash Rent/Crop Share	7.34	2.86	2.01
Taxes and Insurance	1.44	1.91	2.02
Equip.,Bldg. Depreciation	18.12	16.56	21.01
Paid Capital Interest	5.49	6.56	5.73
TOTAL CAPITAL COST	32.39	27.88	30.77
TOTAL COST	86.00	100.02	78.54
	4.45/Bu	5.69/Bu	3.00/Bu
Return to Capital (Cont. Margin)	39.01	-11.85	10.38
Return to Equity	6.62	-39.74	-20.40
Return to Equity (%)	1.62%	-10.94%	-4.05%
Equity	86%	82%	90%
Debt Capacity ($/Ac)	256.01	-93.74	56.96
Productive Value of Land ($/Ac)	140.81	-316.62	-162.73
Market Value of Land ($/Ac)	331.45	351.66	291.15
Machinery Investment ($/Ac)	156.02	137.21	178.57

Variable costs ranged from $47.77 for oats to $72.14 for barley. Material inputs and crop insurance costs accounted for the variation. Material input and fuel/repair costs accounted for 64.8 per cent of the variable costs for wheat production which averaged $53.61 per acre. Most farmers in the Calgary (Oyen-Hanna) area consider their main cropping alternatives to be either wheat on summerfallow or wheat on stubble. Refer to Section V for an economic comparison of these crops which take into account the summerfallow costs. The capital cost structure for the Calgary (Oyen-Hanna) farms was quite low due to the high level of land ownership and the high equity levels. Total production costs for wheat averaged $86.00 per acre compared to $100.02 for barley and $78.54 for oats.

Wheat production was exclusive in terms of profitability as its value of production exceeded its production costs by $6.62 per acre. Production costs exceeded barley returns by $39.74 per acre and oats returns by $20.40 per acre. The productive land value for wheat production was $140.81 compared to its market value of $331.45 per acre.

Lethbridge (Dryland) Region

Similar to the Calgary (Oyen-Hanna) area, the Lethbridge dryland area is most suitable to drought resistant crops as the lack of moisture is the main limiting factor in crop production. Most of the area in these regions have soils which lack drought-resistant characteristics and are therefore used for ranching. In both of these areas wheat production accounts for about one-half of the cultivated area while summerfallowing accounts for about 33 per cent. Barley and canola production were both more pronounced in the Lethbridge area and surprisingly in 1984 were able to generate higher per acre returns than spring wheat. Table 22 also presents data for winter wheat and durum wheat. The 1984 yields for the Lethbridge (dryland) region were 9.93 bushels for spring wheat, 19.93 bushels for barley, 7.93 bushels for canola, 25.01 bushels for winter wheat and 16.30 bushels for durum wheat. As indicated in Section II, crop insurance receipts on the 24 Lethbridge dryland study farms accounted for 28.9 per cent of the value of production. The value of production ranged from $72.09 for spring wheat to $114.54 for winter wheat.

The variable cost structure for wheat in general was slightly lower than that for barley and canola mainly because of lower material costs. Total

TABLE 22: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CROPS SURVEYED IN THE LETHBRIDGE (DRYLAND) REGION - 1984

CROP	SPRING WHEAT	BARLEY	CANOLA	WINTER WHEAT	DURUM WHEAT
Number of Enterprise	35	31	11	11	17
Average Acreage	281.29	125.63	118.64	248.64	162.41
Average Yield (Bu/Acre)	9.93	19.93	7.93	25.01	16.30
	- - - - - - - - - - - Dollars Per Acre -				
Crop Sales	45.50	59.08	63.64	106.83	76.71
Insurance Receipts	26.59	29.77	32.46	7.71	26.20
VALUE OF PRODUCTION	72.09	88.85	96.10	114.54	102.91
	7.26/Bu	4.46/Bu	12.13/Bu	4.58/Bu	6.31/Bu
VARIABLE COST					
Materials	20.97	28.73	29.27	21.06	20.12
Hail/Crop Insurance	5.24	4.93	5.66	3.83	5.37
Fuel and Repairs	10.65	12.22	10.85	10.33	13.05
Paid Labour	4.53	3.62	5.67	5.85	10.23
Operator Labour	10.78	13.40	12.12	5.50	11.85
Miscellaneous	9.14	7.29	8.37	17.10	7.84
TOTAL VARIABLE COST	61.31	70.19	71.94	63.67	68.46
	6.17/Bu	3.52/Bu	9.08/Bu	2.55/Bu	4.20/Bu
CAPITAL COST					
Cash Rent/Crop Share	6.47	6.02	4.70	5.06	10.17
Taxes and Insurance	3.19	3.50	3.52	3.38	3.28
Equip.,Bldg. Depreciation	14.79	16.05	12.30	13.34	16.13
Paid Capital Interest	7.69	5.71	4.35	3.85	4.08
TOTAL CAPITAL COST	32.14	31.29	24.86	25.63	33.65
TOTAL COST	93.46	101.48	96.80	89.30	102.11
	9.41/Bu	5.09/Bu	12.21/Bu	3.57/Bu	6.26/Bu
Return to Capital (Cont. Margin)	10.78	18.65	24.16	50.88	34.45
Return to Equity	-21.37	-12.63	-0.70	25.24	.80
	-4.86%	-2.25%	-0.19%	4.07%	.18%
Equity	86%	88%	88%	94%	91%
Debt Capacity ($/Ac)	51.67	103.18	140.62	323.52	212.30
Production Value of Land ($/Ac)	-90.69	-24.13	55.42	305.36	118.30
Market Value of Land ($/Ac)	635.74	643.43	684.67	581.17	508.38
Machinery Investment ($/Ac)	123.30	131.03	100.78	103.53	132.82

variable costs ranged from $61.31 for spring wheat to $71.94 per acre for canola. Capital costs varied from $24.86 for canola production to $33.65 for durum wheat. Similar to the Peace River and Calgary (Oyen-Hanna) areas, the proportion of rented land to owned land was small in the Lethbridge (dryland) area resulting in relatively low cash rent/crop share costs. This coupled with the high equity levels ranging from 86 to 94 per cent provided for a low capital cost structure. Total production costs ranged from $89.30 per acre for winter wheat to $102.11 for durum wheat.

Only three crops surveyed in the Lethbridge region in 1984 had positive returns to land and these are reflected in the productive land values. These were $55.42 per acre for canola production, $118.30 per acre for durum wheat, and $305.36 per acre for winter wheat. Winter wheat was the most profitable with a return to equity of $25.24 per acre or 4.07 per cent. The production costs were about equal to the value of production for canola and durum wheat production. Machinery investment ranged from $100.78 per acre for canola to $132.82 for durum wheat while the market value of land ranged from $508.38 for durum wheat to $684.67 for canola. According to the 1984 production cost structure for spring wheat and assuming a market price of $4.50 per bushel, the breakeven yield required is 20.77 bushels per acre.

SECTION VII

A COST COMPARISON OF CROP PRODUCTION BY LAND TENURE

With the cost of farm machinery escalating many farmers have turned to renting land either to justify the purchase of farm equipment or to increase their overall farm income. Secondly, with land being considered the most expensive capital resource many farmers have channelled their limited money supply to the purchase of farm equipment thereby increasing the need to cash rent or crop share. As is usually the case a relatively high cost structure is associated with newly purchased land especially if the equity level is low. In such cases, the interest paid per purchased acre will exceed the cash rent/-crop share cost of rented land. Table 23 attempts to show how the equity level and interest rate affect the debt servicing cost per acre.

TABLE 23: DEBT SERVICING REQUIREMENTS FOR A TYPICAL LAND PURCHASE

Example A: $100,000 Land Purchase Price for 160 Acres
12% and 20 Year Term

Equity	10%	20%	30%	40%	50%	60%
	DOLLARS					
Amount of Loan	90,000	80,000	70,000	60,000	50,000	40,000
Annual Debt Serv. Req.	12,049	10,710	9,372	8,033	6,694	5,355
Debt Service/Acre	75.31	66.94	58.57	50.21	41.84	33.47

Example B: $100,000 Land Purchase Price for 160 Acres
6% and 20 Year Term

Equity	10%	20%	30%	40%	50%	60%
	DOLLARS					
Amount of Loan	90,000	80,000	70,000	60,000	50,000	40,000
Annual Debt Serv. Req.	7,846	6,974	6,103	5,231	4,359	3,487
Debt Service/Acre	49.04	43.59	38.14	32.69	27.24	21.80

As a general conclusion, the actual cash rent/crop share values observed in 1984 were about equal to the debt servicing requirements at the 50 per cent equity level.

Table 24 presents a summary of land tenure by region for the average farm participating in the crop case study in 1984. The portion of rented land to total acres farmed ranged from 23.6 per cent in the Peace River region to 52.7 per cent in the Barrhead Region.

Table 24: SUMMARY OF LAND TENURE BY REGION

Region	Total Cultivated Acres	Rented Acres	Owned Acres	Rented Acres As % of Total Acres
Peace River	896.2	211.3	684.9	23.6
Barrhead	1,292.8	681.1	611.7	52.7
Vermilion	1,166.6	369.2	797.4	31.6
Red Deer (Stettler-Coronation)	1,602.6	613.6	989.0	38.3
Calgary (Oyen-Hanna)	1,786.0	659.0	1,127.0	36.9
Lethbridge Dryland	1,438.4	519.6	918.8	36.1
Lethbridge Irrigation	704.4	184.0	520.4	26.1

This section is intended to observe the actual cost difference in the production of grain/oilseeds on owned land versus rented land. Assuming similar yields for both types of land tenure, per acre variable costs are expected to be similar. However, the actual capital cost structure is quite substantial for rented land as the cash rent/crop share cost per acre is greater than the paid capital interest reported by high equity farmers owning land. A general observation was that yields were generally lower on rented land versus owned land. Possible reasons for this are:

1. Less use of fertilizers and chemicals on rented land;
2. More timely field operations on owned land;
3. Varying cultural practices by different tenants over time;

4. Tendency to intensify management and cultural skills on owned land versus rented;
5. Generally, due to the unfamiliarity with newly acquired rented land, management "know-how" are not optimized.

Tables 25 to 31 inclusive provide cost comparisons for grain production by land tenure for selected crops for all areas surveyed in 1984. With reference to Table 25 (Peace River Region), higher yields were observed for all crops grown on owned land resulting in a higher value of production in the range of 5.2 per cent for wheat to 21.6 per cent for canola. As to variable costs, the high material input costs on rented land were partially offset by the lower labour cost. The capital cost for wheat production on owned land was $41.94 per acre compared to $60.01 per acre for wheat on rented land. For canola the cash rent/crop share cost on rented land of $20.40 was almost totally offset by the higher taxes/insurance, depreciation, and paid capital interest observed for the canola owned group. The total production cost for wheat on owned land was $121.53 per acre compared to $144.88 for wheat on rented land. Surprisingly, the canola rented group had a slightly lower cost structure than the canola owned group. For all crops considered, the returns to capital and equity were significantly higher for the crops grown on owned land. For example, the return to equity for canola on owned land was $44.66 per acre (8.68 per cent) compared to $9.45 for canola on rented land (5.92 per cent). In general, the farms with rented land had a lower equity level in their farming operation along with a significnatly lower machinery investment.

Table 26 summarizes the cost and return for wheat, barley, and canola by land tenure in the Barrhead region. With the high productivity reported in this region, the value of cash rent/crop share was well above the average reported in other areas ranging from $31.13 per acre for barley to $40.64 per acre for canola. With the exception of wheat, yields and value of production were higher for barley and canola grown on owned land. As a general observation, farms with rented land were larger in size and thus experienced cost savings in areas such as fuel/repairs and labour. The cash rent/crop share costs associated with rented land largely accounts for the 45 per cent higher total capital costs observed when compared to owned land. The returns to equity on owned land versus rented land were higher for all crops ranging from $60.80 for barley to $127.99 per acre for canola. However, percentage returns

to equity were higher for the rented land due to the lower equity levels these farmers reported.

As indicated in Table 27 higher yields and values of production were reported for all crops grown on owned land in the Vermilion region. Variable costs were also reported to be consistently higher for owned land with material inputs, labour, and fuel/repairs cost, accounting for most of the difference. The cash rent/crop share cost ranged from $28.28 per acre for barley to $34.97 for canola. Once again, this cost on rented land was partially offset by lower taxes/insurance, depreciation, and paid capital interest costs. The actual difference in the capital cost structure for rented land versus owned land ranges from $5.29 per acre for barley to $15.39 per acre for wheat. In conclusion, the higher net return for crop production on owned land was mostly as a result of higher yields and returns as opposed to the lower cost structure.

Although yield and variable cost did vary by land tenure in the Red Deer (Stettler-Coronation) region (Table 28), no firm conclusions can be drawn. Total variable costs ranged from $69.69 per acre for canola summerfallow on owned land to $93.78 per acre for canola summerfallow on rented land. A similar wide range in the capital cost structure was observed, from $36.24 per acre for canola summerfallow owned to $111.27 for canola summerfallow rented. Return to equity ranged from $105.53 per acre for canola summerfallow owned to -$33.07 for wheat stubble rented. As anticipated, the farms with the rented enterprises had a lower equity level and machinery investment relative to the farms with owned land.

A summary of wheat production by land tenure for the Calgary (Oyen-Hanna) Region is presented in Table 29. The higher yields and returns observed for the owned land can be attributed in part to the higher variable cost structure especially in the area of material inputs. Total variable costs for wheat stubble production on rented land was $50.01 per acre compared to $67.97 per acre for wheat stubble on owned land. As in other areas, the cash rent/crop share cost was partially offset by lower taxes/insurance, and paid capital interest costs. As a general conclusion, return to equity for wheat production on owned land was approximately $20.00 per acre higher compared to wheat production on rented land.

Table 30 presents costs and returns data by land tenure for five different crops surveyed in the Lethbridge dryland region. Yields and the value of production were observed to be generally higher on owned land with significant difference observed for the winter wheat, barley, and canola. Canola production was observed to have the highest volume of production on owned land while durum wheat had the highest value on rented land. As a general observation the higher material costs reported for the rented enterprises were more than offset by lower fuel/repair and labour costs giving the rented enterprises a lower total variable cost. As can be observed, the capital cost structure was lower on owned land versus rented land for the crops that were more affected by the drought as the low cash rent/crop share cost was more than offset by cost savings in the area of depreciation, taxes/insurance and paid capital interest.

Differences in the costs and returns structure by land tenure for irrigated sugar beets, soft wheat, and alfalfa hay can be observed in Table 31. With respect to sugar beets, the cash rent/crop share cost of $134.17 per acre was largely offset by lower fuel/repair costs, cash overhead, depreciation and paid capital interest. The net result was a difference of less than $20.00 per acre in the return to equity between rented and owned land. Farms with sugar beets on owned land had an equity of $1,768.36 per acre compared to $794.87 per acre for farms with rented land.

The cash rent/crop share cost for soft wheat production on rented land of $69.61 was more than offset by lower costs for all other variable and capital cost items. Total production cost for soft wheat on rented land was $288.14 compared to $330.09 for owned land. Taking into account the lower yield, the return to equity was -$15.00 per acre for rented land compared to -$14.21 for soft wheat on owned land.

Alfalfa hay production was profitable on both types of land tenure in 1984. Similar to soft wheat production the cash rent/crop share value of $100.04 per acre on rented land was more than offset by lower costs for all other cost items for alfalfa hay on owned land. This, coupled with significantly higher returns provided for a relatively high return to equity of $141.06 per acre or 30.05 per cent for alfalfa hay production on rented land. Alfalfa production on owned land had a return to equity of $40.65 per acre or 3.14 per cent.

TABLE 25: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 PEACE RIVER REGION

	WHEAT		BARLEY		CANOLA	
	OWNED	RENTED	OWNED	RENTED	OWNED	RENTED
Number of Farms	12	4	6	4	7	3
Average Acreage	198.25	190.75	237.50	82.50	229.43	138.33
Yield (Bu/Acre)	34.20	32.41	40.09	38.20	21.61	16.95
	Dollars Per Acre					
Crop Sales	150.47	142.61	106.12	99.31	172.84	135.61
Insurance Receipts	0	0	0	0	0	0
VALUE OF PRODUCTION	150.47	142.61	106.12	99.31	172.84	135.61
VARIABLE COST						
Materials	33.56	38.82	27.09	27.49	30.39	35.34
Fuel/Repairs	19.37	17.29	16.50	18.31	17.66	16.98
Operator Labour	12.46	9.26	11.93	9.61	10.72	8.52
Miscellaneous	14.19	19.50	16.36	17.78	21.18	14.96
TOTAL VARIABLE COST	79.58	84.87	71.88	73.19	79.95	75.80
CAPITAL COST						
Cash Rent/Crop Share	0	27.08	0	21.19	0	20.40
Taxes and Insurance	4.87	1.27	4.22	0.79	4.30	1.60
Bldg. Equip. Depreciation	24.83	21.25	25.41	20.61	26.09	20.44
Paid Capital Interest	12.25	10.42	12.06	8.07	17.85	7.93
TOTAL CAPITAL COST	41.94	60.01	41.69	50.67	48.24	50.37
TOTAL COST	121.53	144.88	113.57	123.86	128.18	126.17
Return to Capital	70.88	57.74	34.24	26.12	92.90	59.81
Return to Equity	28.94 (5.38%)	-2.27 (-1.53%)	-7.45 (-1.36%)	-24.55 (-14.86%)	44.66 (8.68%)	9.45 (5.92%)
Equity ($/Acre)	536.71 (82%)	148.15 (64%)	545.73 (83%)	165.40 (73%)	513.36 (77%)	158.72 (72%)
Machinery Investment	214.95	193.48	222.43	185.69	228.95	188.39

TABLE 26: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 BARRHEAD REGION

	WHEAT		BARLEY		CANOLA	
	OWNED	RENTED	OWNED	RENTED	OWNED	RENTED
Number of Farms	8	11	22	18	17	13
Average Acreage	136.12	257.20	333.81	393.67	168.81	273.25
Yield (Bu/Acre)	48.35	50.86	69.32	63.33	29.51	27.84
	Dollars Per Acre					
Crop Sales	198.63	211.25	186.58	168.65	238.06	227.13
Insurance Receipts	0.78	0.55	2.79	15.67	21.73	7.96
VALUE OF PRODUCTION	199.41	211.80	189.38	184.33	259.78	235.09
VARIABLE COST						
Materials	39.93	45.28	43.25	43.34	46.23	40.27
Fuel/Repairs	16.04	14.45	16.70	15.25	15.82	14.22
Operator Labour	11.22	12.37	14.11	11.40	12.44	10.96
Miscellaneous	9.45	11.79	11.71	11.65	13.12	13.30
TOTAL VARIABLE COST	76.64	83.89	85.77	81.64	87.61	78.75
CAPITAL COST						
Cash Rent/Crop Share	0	37.79	0	31.13	0	40.64
Taxes and Insurance	5.09	1.06	5.26	1.14	5.66	1.24
Bldg. Equip. Depreciation	25.26	25.08	29.02	25.12	28.76	24.72
Paid Capital Interest	6.62	3.47	8.52	2.87	9.75	3.92
TOTAL CAPITAL COST	36.97	67.39	42.80	60.26	44.18	70.52
TOTAL COST	113.61	151.28	128.58	141.89	131.79	149.27
Return to Capital	122.77	127.91	103.60	102.69	172.17	156.34
Return to Equity	85.80	60.52	60.80	42.44	127.99	85.82
Return to Equity (%)	7.41%	24.62%	6.00%	16.60%	11.10%	35.84%
Equity ($/Acre)	1153.01 (94%)	247.00 (88%)	1007.85 (91%)	256.51 (91%)	1148.11 (93%)	240.24 (87%)
Machinery Investment	217.50	220.86	249.98	220.50	250.09	218.19

TABLE 27: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 VERMILION REGION

	WHEAT		BARLEY		CANOLA	
	OWNED	RENTED	OWNED	RENTED	OWNED	RENTED
Number of Farms	35	21	27	12	32	16
Average Acreage	320.20	198.10	176.63	275.67	231.25	307.87
Yield (Bu/Acre)	34.71	32.12	50.23	44.24	26.56	19.61
	Dollars Per Acre					
Crop Sales	158.13	142.73	137.34	117.55	212.49	156.84
Insurance Receipts	1.96	3.93	2.01	4.31	4.08	9.25
VALUE OF PRODUCTION	160.09	146.66	139.35	121.87	216.57	166.09
VARIABLE COST						
Materials	35.15	34.31	36.26	40.77	40.52	37.76
Fuel/Repairs	14.80	12.98	17.24	13.65	16.55	13.85
Operator Labour	15.41	14.33	17.17	13.37	16.94	12.95
Miscellaneous	14.70	11.88	13.87	5.29	15.74	13.63
TOTAL VARIABLE COST	80.06	73.50	84.54	73.08	89.75	78.19
CAPITAL COST						
Cash Rent/Crop Share	0	34.15	0	28.28	0	34.97
Taxes and Insurance	4.04	0.95	4.31	1.02	4.36	1.31
Bldg. Equip. Depreciation	24.94	21.04	31.13	20.87	28.84	19.08
Paid Capital Interest	16.28	4.52	14.26	4.81	12.67	5.55
TOTAL CAPITAL COST	45.26	60.65	49.69	54.98	45.87	60.91
TOTAL COST	125.32	134.16	134.23	128.05	135.62	139.10
Return to Capital	80.03	73.16	54.82	48.79	126.82	87.90
Return to Equity	34.77 (5.07%)	12.51 (6.35%)	5.12 (0.69%)	-6.19 (-3.18%)	80.95 (11.15%)	26.99 (16.11%)
Equity ($/Acre)	686.67 (84%)	197.82 (85%)	745.65 (85%)	195.61 (85%)	729.19 (86%)	166.46 (79%)
Machinery Investment	219.25	188.04	273.79	187.18	254.86	170.84

TABLE 28: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 RED DEER (STETTLER-CORONATION) REGION

	WHEAT STUBBLE				CANOLA STUBBLE				CANOLA SUMMERFALLOW			
	OWNED		RENTED		OWNED		RENTED		OWNED		RENTED	
Number of Farms	6		5		7		3		4		3	
Average Acreage	326.83		402.00		252.29		200.00		135.62		158.33	
Yield (Bu/Acre)	25.37		22.36		14.84		13.88		18.58		23.21	
	---------- Dollars Per Acre ----------											
Crop Sales	112.89		103.83		136.25		110.46		166.37		214.94	
Insurance Receipts	18.16		1.85		13.65		9.38		45.09		0.91	
VALUE OF PRODUCTION	131.05		105.68		149.90		119.84		211.46		215.85	
VARIABLE COST												
Materials	36.17		42.54		44.80		39.31		20.76		37.27	
Fuel/Repairs	11.42		10.61		9.76		8.23		13.03		12.52	
Operator Labour	13.22		8.65		9.56		7.91		19.62		10.78	
Miscellaneous	16.02		18.64		25.06		14.31		16.28		33.21	
TOTAL VARIABLE COST	76.83		80.44		89.18		69.76		69.69		93.78	
CAPITAL COST												
Cash Rent/Crop Share	0		32.63		0		32.80		0		73.74	
Taxes and Insurance	4.21		0.65		3.06		0.15		5.10		0.97	
Bldg. Equip. Depreciation	23.22		17.13		20.13		11.05		23.72		24.23	
Paid Capital Interest	11.61		7.91		19.64		3.97		7.43		12.33	
TOTAL CAPITAL COST	39.04		58.31		42.82		47.97		36.24		111.27	
TOTAL COST	115.87		138.75		132.00		117.72		105.93		205.05	
Return to Capital	54.21		25.24		60.71		50.08		141.77		122.07	
Return to Equity	15.17	(2.35%)	-33.07	(-24.70%)	17.89	(3.49%)	2.11	(2.47%)	105.53	(13.29%)	10.79	(5.36%)
Equity ($/Acre)	645.78	(83%)	134.00	(67%)	513.66	(72%)	85.41	((71%)	793.67	(90%)	201.74	(67%)
Machinery Investment	206.99		142.52		162.37		100.66		216.81		183.59	

TABLE 29: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 CALGARY (OYEN-HANNA) REGION

	WHEAT STUBBLE				WHEAT SUMMERFALLOW			
	OWNED		RENTED		OWNED		RENTED	
Number of Farms	4		4		6		3	
Average Acreage	331.25		319.00		393.67		424.00	
Yield (Bu/Acre)	19.63		12.94		21.79		20.79	
	- - - - - - - - - Dollars Per Acre - - - - - - - - -							
Crop Sales	85.42		56.59		101.64		92.29	
Insurance Receipts	5.33		4.96		6.63		4.79	
VALUE OF PRODUCTION	90.75		61.55		108.27		97.08	
VARIABLE COST								
Materials	36.37		24.94		21.15		14.66	
Fuel/Repairs	12.27		9.34		11.49		9.72	
Operator Labour	9.70		7.26		8.36		6.84	
Miscellaneous	9.63		8.47		11.88		12.22	
TOTAL VARIABLE COST	67.97		50.01		52.88		43.44	
CAPITAL COST								
Cash Rent/Crop Share	0		15.08		0		20.87	
Taxes and Insurance	2.04		0.73		1.86		0.72	
Bldg. Equip. Depreciation	21.45		17.68		16.91		17.34	
Paid Capital Interest	6.02		4.40		6.24		4.65	
TOTAL CAPITAL COST	29.52		37.89		25.00		43.58	
TOTAL COST	97.48		87.90		77.89		87.02	
Return to Capital	22.78		11.54		55.38		53.64	
Return to Equity	-6.73	(-1.34%)	-26.36	(-16.33%)	30.38	(6.32%)	10.06	(6.45%)
Equity ($/Acre)	500.65	(88%)	161.42	(82%)	480.26	(85%)	156.43	(81%)
Machinery Investment	180.84		156.70		142.84		153.65	

TABLE 30: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 LETHBRIDGE (DRYLAND) REGION

	SPRING WHEAT				WINTER WHEAT				DURUM WHEAT			
	OWNED		RENTED		OWNED		RENTED		OWNED		RENTED	
Number of Farms	20		15		8		3		10		7	
Average Acreage	266.60		300.87		285.00		151.67		157.90		168.96	
Yield (Bu/Acre)	11.66		7.89		26.12		19.48		16.17		16.47	
	Dollars Per Acre											
Crop Sales	53.87		35.62		111.53		83.24		77.23		76.01	
Insurance Receipts	25.52		27.85		8.48		3.86		26.25		26.15	
VALUE OF PRODUCTION	79.39		63.47		120.02		87.11		103.47		102.16	
VARIABLE COST												
Materials	20.66		21.34		22.89		11.87		18.74		21.97	
Fuel/Repairs	11.64		9.48		10.58		9.11		15.19		9.21	
Operator Labour	10.77		10.79		6.06		2.66		16.11		6.17	
Miscellaneous	18.81		19.03		24.53		38.06		22.24		26.01	
TOTAL VARIABLE COST	61.88		60.64		64.06		61.70		72.28		63.36	
CAPITAL COST												
Cash Rent/Crop Share	0		14.12		0		30.44		0		23.75	
Taxes and Insurance	4.99		1.06		3.79		1.28		4.70		1.37	
Bldg. Equip. Depreciation	16.63		12.62		14.23		8.87		20.27		10.58	
Paid Capital Interest	11.49		3.20		4.36		1.31		4.81		3.11	
TOTAL CAPITAL COST	33.11		31.00		22.39		41.89		29.78		38.81	
TOTAL COST	95.00		91.64		86.44		103.60		102.07		102.17	
Return to Capital	17.51		2.83		55.96		25.40		31.19		38.79	
Return to Equity	-15.61	(-2.20%)	-28.17	(-23.34%)	33.57	(4.64)	-16.49	(-15.77%)	1.41	(0.20%)	-0.02	(-0.02%)
Equity ($/Acre)	708.06	(86%)	121.22	(83%)	720.28	(94%)	104.05	(92%)	687.19	(92%)	100.17	(80%)
Machinery Investment	137.57		106.45		111.36		64.31		167.55		86.43	

TABLE 30: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 LETHBRIDGE (DRYLAND) REGION (Cont'd)

	CANOLA				BARLEY			
	OWNED		RENTED		OWNED		RENTED	
Number of Farms	7		4		19		12	
Average Acreage	77.29		191.00		135.32		119.83	
Yield (Bu/Acre)	12.41		4.75		22.24		13.17	
	----------		-Dollars		Per Acre-		----------	
Crop Sales	99.01		38.59		66.66		37.76	
Insurance Receipts	27.94		35.67		30.16		36.66	
VALUE OF PRODUCTION	126.95		74.25		96.82		74.42	
VARIABLE COST								
Materials	26.69		31.09		28.44		29.74	
Fuel/Repairs	13.94		8.67		13.16		9.52	
Operator Labour	13.36		11.23		14.41		12.05	
Miscellaneous	23.78		16.81		16.26		13.74	
TOTAL VARIABLE COST	77.77		67.80		72.27		65.05	
CAPITAL COST								
Cash Rent/Crop Share	0		8.02		0		16.46	
Taxes and Insurance	7.48		0.71		4.69		0.94	
Bldg. Equip. Depreciation	18.29		8.07		17.20		15.49	
Paid Capital Interest	6.32		2.95		6.87		4.46	
TOTAL CAPITAL COST	32.08		19.75		28.76		37.36	
TOTAL COST	109.85		87.55		101.02		102.42	
Return to Capital	49.18		6.45		24.56		9.37	
Return to Equity	17.10	(2.10%)	-13.30	(-20.25%)	-4.20	(-0.55%)	-27.99	(-20.30%)
Equity ($/Acre)	819.24	(90%)	65.34	(74%)	761.27	(88%)	137.18	(78%)
Machinery Investment	139.90		73.08		138.95		134.00	

TABLE 31: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1984 LETHBRIDGE (IRRIGATION) REGION

	SUGAR BEETS				SOFT WHEAT				ALFALFA HAY			
	OWNED		RENTED		OWNED		RENTED		OWNED		RENTED	
Number of Farms	19		10		24		13		9		3	
Average Acreage	82.79		49.60		271.08		143.92		64.78		58.33	
Yield (Bu/Acre)	16.99	Tonnes	17.65	Tonnes	72.01		64.26		4.63	Ton	4.37	Ton
	- Dollars Per Acre -											
Crop Sales	594.49		617.72		314.13		265.87		375.53		440.72	
Insurance Receipts	0		0		1.75		7.27		0		0	
VALUE OF PRODUCTION	594.49		617.72		315.88		273.14		375.53		440.72	
VARIABLE COST												
Materials	158.55		162.39		62.72		57.05		24.48		22.73	
Fuel/Repairs	94.63		89.68		38.24		33.30		54.38		41.76	
Operator Labour	28.83		35.41		31.97		22.49		28.24		53.34	
Miscellaneous	160.18		145.71		56.36		45.07		69.05		18.04	
TOTAL VARIABLE COST	442.19		433.19		189.29		157.91		176.15		135.87	
CAPITAL COST												
Cash Rent/Crop Share	0		134.17		0		69.61		0		100.04	
Taxes and Insurance	22.82		5.79		17.73		2.45		18.26		1.99	
Bldg. Equip. Depreciation	120.53		98.62		50.87		45.81		67.58		52.07	
Paid Capital Interest	75.73		31.09		72.19		12.36		72.89		9.69	
TOTAL CAPITAL COST	219.08		269.66		140.80		130.23		158.73		163.79	
TOTAL COST	661.27		702.85		330.09		288.14		334.88		299.66	
Return to Capital	152.30		184.53		126.59		115.23		199.38		304.85	
Return to Equity	-66.78	(-3.78%)	-85.13	(-10.70%)	-14.21	(1.24%)	-15.00	(-3.73%)	40.65	(3.14%)	141.06	(30.05%)
Equity ($/Acre)	1768.36	(73%)	794.87	(77%)	1153.80	(65%)	401.36	(81%)	1286.94	(67%)	466.86	(85%)
Machinery Investment	1156.15		940.01		448.84		420.71		631.59		492.06	